This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

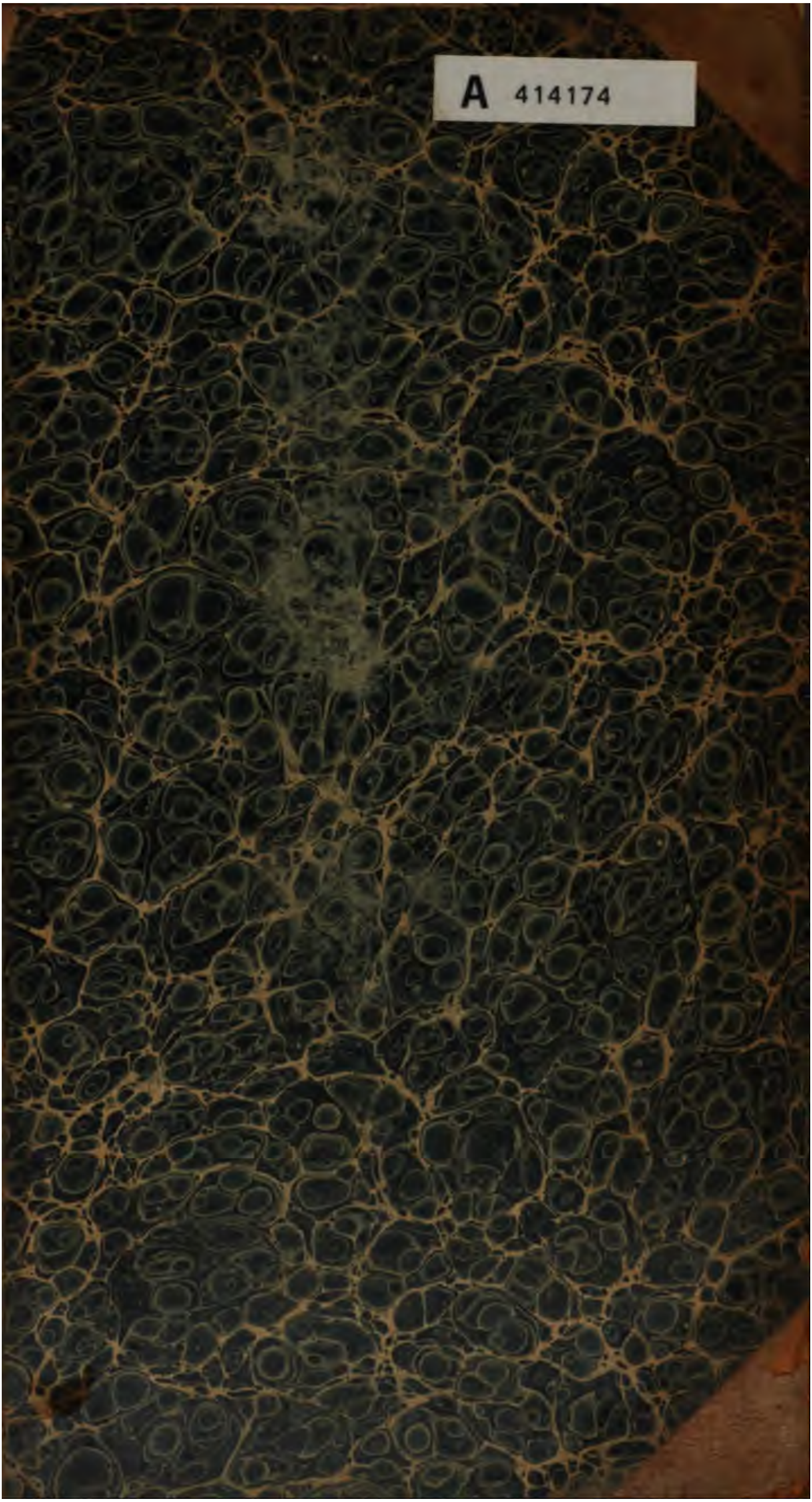
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

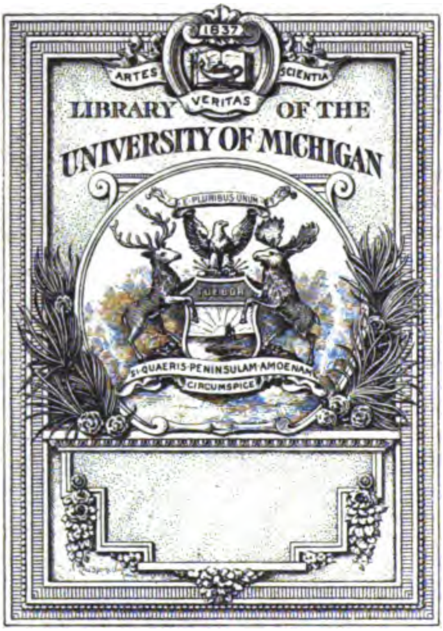
+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`



A 414174


1837
ARTES
SCIENTIA
VERITAS
LIBRARY OF THE
UNIVERSITY OF MICHIGAN
E PLURIBUS UNUM
TUEBOR
SI QUAERIS PENINSULAM AMOENAM
CIRCUMSPICE

610.5
R44

24766

THE

RETROSPECT

OF

PRACTICAL MEDICINE AND SURGERY,

BEING

A Half-Yearly Journal,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

W. BRAITHWAITE, M.D.,

LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN AT THE LEEDS SCHOOL OF MEDICINE, ETC.,

AND

JAMES BRAITHWAITE, M.D., LOND.,

ASSISTANT-SURGEON TO THE LEEDS HOSPITAL FOR WOMEN AND CHILDREN.

PART LXVI...........JANUARY...................1873.

UNIFORM AMERICAN EDITION.

NEW YORK:
PUBLISHED BY W. A. TOWNSEND.
1873.

S. W. GREEN, Printer, 16 and 18 Jacob Street, New-York.

CONTENTS OF VOL. LXVI.

SYNOPSIS.

PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

	ARTICLE.	AUTHOR.	PAGE
1	On Typhoid Fever	*Sir W. Gull, M.D.*	17
2	On the Extinction of Typhoid Fever in the Millbank Prison by the Disuse of Thames Water	*Surgeon-Major A. C. C. De Renzy.*	20
3	The Treatment of Enteric or Typhoid Fever	*Dr. James Little*	22
4	On the Use of Stimulants in severe cases of Febrile and Inflammatory Diseases .	*Dr. L. S. Beale*	24
5	On the Treatment of Hyperpyrexia by the External Application of Cold . .	*Dr. Straus*	37
6	The Cold Bath in the Treatment of Enteric and Typhus Fevers . . .	*Dr. A. Collie*	38
7	The Treatment of Small-Pox by Vaccination	*Dr. W. Marshall*	40
8	On the Treatment of Small-Pox by Vaccination and the Injection of Lymph .	*R. C. Furley, Esq.*	41
9	Cases of Small-Pox treated by the Hypodermic Injection of Vaccine Lymph . .	*Dr. R. Grieve*	42
10	A New Theory of Gout	*Dr. A. Meldon*	46
11	On the Treatment of Rheumatic Gout by the Aid of the Constant Galvanic Current .	*Dr. Julius Althaus*	47
12	On a Case of Acute Rheumatism, with Head Symptoms and High Temperature, successfully treated with Baths . .	*Dr. H. Thompson*	51

DISEASES OF THE NERVOUS SYSTEM.

	ARTICLE.	AUTHOR.	PAGE
13	Sciatica, Lumbago, and Brachialgia; their Nature and Treatment, and their immediate Relief and Rapid Cure by Hypodermic Injection of Morphia	*Dr. H. Lawson*	54
14	Case of Traumatic Tetanus successfully treated with Chloral and Bromide of Potassium	*Dr. A. Fergusson*	55
15	On a Case of Traumatic Tetanus . .	*Dr. G. W. Roberts*	56
16	Chloral in Delirium Tremens . .	*Dr. J. Barclay*	57
17	A Case of Paraplegia lasting five years; Electrical Anæsthesia.—Question of Malingering	*Dr. W. Moxon*	57
18	Guarana a Remedy for Sick-Headache .	*Dr. S. Wilks*	59
19	Guarana Powder a Remedy for Sick-Headache	*Dr. P. W. Latham*	59
20	Bromide of Potassium in Epilepsy . .	*Dr. L. du Saulle*	60
21	Magneto-Electricity in the Treatment of Muscular Atrophy	*Dr. A. P. Fiddian*	60
22	On Auditory Vertigo (Meniere's Disease) .	*Dr. J. Hughlings-Jackson*	63

DISEASES OF THE ORGANS OF CIRCULATION.

ARTICLE.	AUTHOR.	PAGE.
23 The Relative Frequency of Disease between the Right and Left Sides of the Heart	*Dr. C. Black*	65

DISEASES OF THE ORGANS OF RESPIRATION.

24 On Asthma	*Dr. C. J. B. Williams*	73
25 On Vesicular Emphysena of the Lungs, and Habitual Asthma	*Do.*	77
26 On Croup	*Dr. R. C. R. Jordan*	80
27 Chloral in Croup	*Dr. J. Barclay*	83
28 On the Treatment of Hooping Cough	*Dr. W. Maccall*	84
29 Consumption and Contagion	*Dr. R. Payne Cotton*	85
30 A Remedy for Catarrh	*Dr. E. Brand*	87

DISEASES OF THE URINARY ORGANS.

31 Improved Method for the Microscopic Examination of Urine	*Ed. British Med. Journ.*	87
32 Cases illustrating the action of Continuous Electric Currents on Spasms of the Bladder, Urethra, and Ureters	*Dr. Reliquet*	88
33 On a Method of detecting Small Quantities of Sugar in Urine	*Dr. J. Seegen*	91

SURGERY.

FRACTURES, DISLOCATIONS, AND DISEASES OF BONES, JOINTS, &C.

34 Plastic Apparatus in Surgery, with especial Reference to that variety made with Plaster of Paris	*Dr. S. B. St. John*	93
35 Hip and Shoulder Dislocations, and their Reduction without Traction	*Dr. R. Parker*	100
36 On the Treatment of "Persistent" Inflammation by the Local Application of Solutions of Mercury and Morphia	*J. Marshall, Esq.*	102
37 On the Spiral Spring Extender; being a New and Simple Apparatus for making extension in Diseased Joints	*C. Holthouse, Esq.*	107
38 New method of Putting up Fractured Clavicle	*Dr. L. A. Sayre*	108
39 Dr. Sayre's Splint applied to Fractured Neck of Femur	*W. Colles, Esq.*	108
40 The Anterior Suspending Splint in the Treatment of Fractures of the Lower Extremity	*Dr. C. Shrimpton*	110
41 Elevation of Depressed Cranial Bone by Pneumatic Traction	*H. W. Larkin, Esq.*	113

ORGANS OF CIRCULATION.

42 The Surgical Treatment of Aneurism in its various Forms	*T. Holmes, Esq.*	114
43 On the Treatment of Aneurism	*T. Bryant, Esq.*	126
44 A Case of Popliteal Aneurism cured by Pressure	*Dr. J. K. Barton*	129

ALIMENTARY CANAL.

ARTICLE.	AUTHOR.	PAGE
45 On Strangulated Hernia	*Sir J. Paget*	131
46 The Treatment of Strangulated Hernia by Puncture of the Intestine . . .	*Editor of the Medical Times and Gazette*	147
47 Strangulated Inguinal Hernia of the Right Side	*Dr. L. Labbe*	148
48 On the Treatment of Hemorrhoids . .	*Editor of the British and Foreign Medico-Chirurgical Review*	149
49 Cases of Stricture of the Rectum, treated by different methods, one of them by Electrolysis	*Dr. W. R. Whitehead*	155
50 On Removal of the Tongue for Epithelial Cancer	*J. Wood, Esq.*	161
51 Two New Forms of Enema Apparatus .	*W. L. Shepard Esq.*	163

ORGANS OF URINE AND GENERATION.

ARTICLE.	AUTHOR.	PAGE
52 On Lithotomy	*Professor Humphry*	164
53 On Lithotomy and Lithotrity . .	*Dr. J. Cooper Forster*	168
54 Instruments for treating Affections of the Genito-Urinary Organs, not commonly known in England	*W. F. Teevan, Esq.*	169
55 A New Method of Treating Hydrocele .	*S. M. Bradley, Esq.*	173
56 Varicocele	*Sydney Jones, Esq.*	174

AFFECTIONS OF THE EYE AND EAR.

ARTICLE.	AUTHOR.	PAGE
57 The Treatment of Cases of Strumous Ophthalmia	*Dr. H. Power*	174
58 On the Modern Art of Tinting Opacities of the Cornea	*Dr. C. B. Taylor*	177
59 A New Method of Destroying Faulty Cilia in Cases of Limited Trichiasis or Districhiasis	*P. J. Hayes, Esq.*	178
60 On the Preservation or Destruction of the Conjunctiva in cases of Extirpation of the Globe	*J. F. Streatfeild, Esq.*	180
61 When and Where to Iridectomise in cases of Anterior Synechiæ requiring an Artificial Pupil Operation	*Do.*	182
62 On the Advantages of using Two Sharp-Hooks when it is necessary to employ Traction in Cataract Operations . .	*Do.*	183
63 A few Practical Remarks on the Treatment of Cataract	*G. Critchett, Esq.*	189
64 Two Cases of Amaurosis treated by the Subcutaneous Injection of Strychnia . .	*C. Higgins, Esq.*	191
65 Practical Observations in Ophthalmic and Aural Surgery	*E. Hart, Esq.*	193
66 On some Affections of the Ear . .	*Dr. W. B. Dalby*	194
67 Foreign Bodies in the Ear . . .	*Dr. Lowenberg*	197
68 On the Treatment of Exanthemal Catarrh of the Tympanum	*Dr. J. P. Cassells*	199

AFFECTIONS OF THE SKIN.

ARTICLE.	AUTHOR.	PAGE
69 On the General Principles of Cutaneous Therapeutics	*Dr. Tilbury Fox*	201
70 Some Remarks on the Pathology and Treatment of Acne	*J. L. Milton, Esq.*	207

ARTICLE.		AUTHOR.	PAGE
71	The Treatment of Ulcers of the Leg . .	*B. Holt, Esq.*	211
72	Removal of Corns		211
73	Ingrowing Nail	*B. Blower, Esq.*	211

SYPHILITIC AFFECTIONS.

74	On Syphilis	*M. Ricord*	212

MIDWIFERY,

AND THE DISEASES OF WOMEN AND CHILDREN.

75	A New Use of Barnes's Dilators . .	*Dr. H. M. Morgan*	216
76	On the External and Internal Orifices of the Uterus: their Anatomy, Physiology, and Pathology	*Dr. J. H. Bennet*	217
77	Ergot and Abortion	*A. Freer, Esq.*	219
78	Perineal Lacerations	*Dr. J. G. Swayne*	220
79	Case of Shoulder Presentation, with Rigid Os and Prolapse of Funis: Turning Impossible: Delivery effected by Spondylotomy	*Drs. Affleck & A. Macdonald*	223
80	A Successful Case of Immediate Transfusion	*Dr. J. H. Aveling*	227
81	Epileptic Puerperal Convulsions and Puerperal Mania treated by Chloral Hydrate .	*F. V. M'Dowell, Esq.*	230
82	The Treatment of Inertia of the Uterus .	*Lawson Tait, Esq.*	231
83	On Dysmenorrhœa	*Dr. J. M. Duncan*	232
84	Enlargement of the Uterus considered specially with reference to Diagnosis .	*Dr. L. Atthill*	237
85	On Procidentia of the Uterus, and of the Bladder	*Dr. E. Kennedy*	242
86	On Fibrous Tumours of the Uterus . .	*Dr. G. H. Kidd*	243
87	Case of Imbedded Uterine Fibroid . .	*Dr. J. Whiteford*	248
88	Two Cases of Chronic Inversion of the Uterus	*Dr. J. B. Hicks*	249
89	Rachitis and Mineral Inanition . .	*Dr. Blache*	253
90	On the Physiological Dyspepsia for Starchy Food in Infancy	*Dr. P. Sonsino*	256
91	The Use of Pancreatic Emulsion in the Wasting Diseases of Children . . .	*Dr. Dobell*	258
92	On Infantile Paralysis and its resulting Deformities	*R. Barwell, Esq.*	261
93	A Case of Spina Bifida cured by Injection .	*Dr. J. Morton*	264
94	New Sponge Tents, &c. . . .	*Lawson Tait, Esq.*	266

PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

1.—ON TYPHOID FEVER.

By Sir WILLIAM GULL, M.D.

[The following is from a lecture delivered at Guy's Hospital, by Sir William Gull, on June 20th, this year. He remarked that it is 250 years since a King of England died of ague, a disease which now is comparatively rare, and foretold that typhoid fever would in another 250 years be equally uncommon, seeing that, like ague, it arises from preventible causes.]

Typhoid fever is stated to kill 17,000 a year in England; how great, then, must be the number attacked! It stood among the preventible diseases, and it was important, therefore, to know how it originates. There is no scientific theory, but there is a good working theory on the point. The origination of the disease is, somehow or another, connected with drainage. It has, therefore, been called the filth fever; hence to get rid of the filth is to get rid of the fever. It seems as if this really is so, for Millbank Prison was infested with typhoid and dysentery; but now the water-supply has been changed, and the drainage attended to, and these diseases have almost entirely disappeared. No one can approach a case of typhoid fever without paying some attention to hygiene. It is no use tinkering with the disease if one does not try to prevent it, and it no doubt may be prevented. The theory is that it is connected with germs which get into the blood; we know nothing about these germs—the air is full of them. There is an idea that they are imbibed by drinking water, and that they increase and multiply within the body. Although this has not been demonstrated, yet it is a good working theory.

The history of an attack of typhoid fever is somewhat obscure. The poison lurks in the body some time before the real onset of fever; it may be as long as five or six weeks. The disease then begins insidiously and irregularly; the prodromata are uncertain. Where does this poison work? Is it in the intestinal tissue, or in the mucous membranes, or in the absorbent system? We do not know; we say that it is in the blood. Where are these lurking beginnings? These are probably in the intestinal system, for we find digestive disorders and disturbance of the bowels in the first instance. It is, however, very difficult to say when the disease begins; but if the ordinary course of health be represented by a straight line, we shall find at the commencement of the disease an abrupt deviation from this straight line, which deviation goes on increasing till the fourth to the sixth day; consequently, we find that on the fourth day the patient is ill, and on the fifth or sixth day very ill and obliged to keep his bed. It is about this time that we first see these patients as a rule, and how are we to tell that they have got fever? Well, by the little instrument called the thermometer. Now, if on even the first day the temperature be normal in the afternoon, there is no fever. In typhoid the temperature increases 1·5° to 2·0°, or even 2·5° F. in the first twenty-four hours. If a person who has been exposed to typhoid fever have a headache, and his temperature be 101·5° on the first day, it may be typhoid; but if, as is sometimes the case in persons who have been nursing, the temperature be below normal, or even if it be normal, you may be certain that there is not fever present. On the other hand, if on the first day the temperature be 105° you may be certain that the disease is not typhoid. We see, therefore, that whether the temperature be too low or too high the thermometer will greatly assist us in making a diagnosis. The temperature goes on rising about 1·5° per diem till about the fifth or sixth day, when it reaches its maximum of about 103·5° or 104·0°, or even more. This is not absolutely true, because some persons may go through typhoid fever and know nothing at all about it. In this disease, therefore, we see that there is first a long and uncertain prodromal stage, and then the onset of fever, which is insidious. Although the degree of temperature is reliable in determining the presence or absence of fever, the same cannot be said of the condition of the pulse, for, in nervous patients, the rapidity of the pulse may be greatly increased, and yet no fever be present. It therefore becomes an important thing to use the thermometer in practice; it will save many errors if used at the proper hour of the day—that is, in the afternoon.

To return to the course of typhoid fever, we find (still adhering to the chart) that on the twenty-first day the curved line suddenly runs into the straight line of ordinary health, and the fever is completed. In some cases, however, this does not take place till the twenty-eighth day. During this course we cannot give an answer to the queries of the patient's friends, "Is he better?" We must refer them to the chart, and tell them what is the course through which the disease must go. "We shall find no word 'better' written anywhere on the curve." Without this is borne in mind much annoyance may be given to the friends, for in the morning the patient may be cooler and appear better, but in the evening he is hotter and appears worse, and if the medical man were to alter his opinion according to the degree of temperature, the friends might say that the attendant knew nothing whatever about the disease. It is necessary to wait the natural term of the disease before we can say whether the patient is better; moreover, we must bear in mind that two charts of the course of the disease may be drawn out, one in which the disease is represented as lasting twenty-one days, and the other in which it lasts twenty-eight days. But it is not always easy to say which is the twenty-first or twenty-eighth day, as it is so difficult often to fix the date at which the disease began; but by carefully recording the temperature we may tell the time to a couple of days. On the other hand, it is not always that we can say positively the patient is better on these days, for the disease may, as it were, begin again, and exactly repeat itself, and this repetition may last twenty-eight days more, or it may even triple itself, as Sir William taught many years ago, when lecturing on this subject to the students at Guy's Hospital. This triple attack may last as long as the previous ones. These repetitions have been found on post-mortem examination to correspond with fresh outbreaks of the intestinal affection; for in these cases, should death occur, some of the ulcers will be found almost healed while others are just beginning to be affected. It is always necessary, therefore, to give a prognosis which shall allow of the possibility of these secondary attacks. But these repeated attacks do not necessarily last as long as the previous ones; they may be much shorter, lasting only one, two, or three weeks. So that typhoid fever may have a simple course of twenty-one days, or a prolonged course of twenty-eight days, or a double or triple course, the duration of which equals that of the previous attack; or lastly, a complex course—one or two attacks of ordinary duration, with another of shorter duration.

Now in whatever manner the poison of typhoid is introduced into the system there is a concentration in the ileum. The presence or absence of diarrhœa depends on the implication or not of the large intestine. Although the ileum is the focus of the operation of the poison, yet it does not end here, for it is reflected to every organ of the body. The incidence of the poison is on the ileum, but the reflection is over the whole body. The body reacts to these conditions, and the fever is a reaction to the local condition of the bowels; but this does not imply that typhoid fever is a local affection of the bowels, as was formerly taught. This poison reacts in other ways, as by setting up ulceration in various parts of the body. He was once called to the case of a young girl who was sickening of an illness. She had a discharge from the vagina, which led the medical attendant to doubt the girl's chastity; but he (Sir William) said that it was typhoid, and that the discharge was due to ulceration of the vagina. Another case, in Guy's Hospital, was treated as a gonorrhœa; but in reality the patient had ulceration of the prepuce from typhoid fever. In a third case, the patient had perforating ulceration of the larynx, and he suddenly became emphysematous over the body, which "floored" him (Sir William); but this case was shown after death to be one of ulceration of the larynx occurring in the course of typhoid fever. This disease then is not a local one, although the focus of the action is in the ileum. But to return to the chart. About the ninth day of the disease mischief begins to show itself in the intestines, and at this time the deposit may open up a large bloodvessel, and thus give rise to severe hemorrhage, or, if it go still deeper, perforation of the bowel may take place; or the bronchial membranes may become affected, or the bronchial glands enlarged, which may give rise by reflex action to spasm of the larynx. Every organ in the body is affected if the disease be severe. Every part of the body may be affected through the nervous system. There is a tendency to reaction. There may be pleurisy; or the enlarged mesenteric glands may soften and suppurate, which may be followed by purulent infection, or the kidneys may become diseased. In fact, any organ may become affected through the action of the nervous, venous, or other systems.

Now as to the treatment. This disease cannot be cut short even in its early stage. Some have thought that it could be done by emetics, but few think so now. Others have thought that a purge of calomel and colocynth would cut short the attack, but this has been almost entirely given up. Others say that large doses of quinine will shorten the attack, or, at least, prevent serious complications; but Sir William related a case to which he was called, where large doses of quinine had been given, but the man was almost dead from hemorrhage, so that, in this case, the disease was neither cut short nor complications prevented. At the present time it must be granted that when once the patient has begun to go down the curve we must not dose him with medicines—we must not give him physic. The best thing is to place him in bed in a horizontal position, and reserve his nervous power, remembering that he must, if he live, go through the whole course of the disease. He has to go through the reactions of his nervous, absorbent, and nutritive systems; he has, in fact, to go through "a great physiological storm." Let the patient alone then in this stage; "an early rest will save his power." But how is he to be treated through the remainder of the course? Is there anything to make the course less severe? Probably not. Quinine has been tried for this also, but has failed here as signally as when given to cut short the disease. It must be said that all the treatment consists of simple measures and simple diet. Medicines are only required for special conditions: for instance, if diarrhœa occur, some would give what is called "chalk mixture"; but we must remember that this has to go through about twenty-five feet of intestine. The best thing is to fill the rectum with five or six ounces of starch; it is not even necessary to put any opium with the starch. The diarrhœa only takes place when the rectum, sigmoid flexure, or descending colon is affected or irritated by acrid matters; hence, if you fill these, the contact of noxious matters is prevented, and the diarrhœa checked. Time would not allow of more being said on this. [Here Sir William said he was not lecturing on typhoid fever, but only giving a few thoughts.] If hemorrhage occur, many would give gallic acid, or tannic acid, or lead, or some powerful astringent. But do not so; "don't begin with all your great guns at once." It is best to trust to the hemorrhage to cure itself, which it will do, and keep the patient at rest in the horizontal posture, giving a little opium (half a grain) by rectum or mouth if necessary to quiet the intestines. Ice may also be applied to the abdomen. This is sound advice, although it may appear terrible. The objection to giving lead or gallic acid or other powerful astringents is that they are apt to make the patient sick, and in that manner perhaps to make the hemorrhage worse. Often delirium comes on in the course of the disease. The patient may get out of bed, or even commit suicide by jumping out of the window. What is to be done for the delirium? In the first place, never leave the patient alone day or night after he has begun to descend the curve, for delirium may come on at any time; therefore, he must be constantly watched. In the treatment of this complication remember that it is due to brain-irritation, and not to inflammation, as some have imagined. There is one great remedy for this, and it is alcohol; alcohol is the remedy for nervous irritation in typhoid fever, and, in fact, in any fever. How it acts is not certainly known, but it may be laid down that it is an important point in the treatment of all fevers. It allays nervous irritation and soothes the nervous system. Whenever, therefore, there is delirium or reflex irritation, give alcohol in some form or another, as brandy or wine; but when the result has been obtained, stop it; only give it when it is necessary. In fevers the use of stimulants is for the delirium, and it in no way alters the local processes, but only the reflex condition. All cases do not require alcohol, and some only require it occasionally, and for a short time. Delirium even in the early stages may be checked by brandy, and never again come on during the whole course of the disease.

There is another point. Often the patient cannot or ought not to be moved out of bed. How is he to pass his stools? There is a danger of bedsores if care be not exercised to prevent them; but no man who has a due care ought, under ordinary circumstances, to have a patient suffering from bedsores; sometimes, however, the circumstances are such that these sores cannot be prevented. The bed-pan may become the source of a bedsore which may carry off the patient. Avoid, therefore, every possible cause of irritation or abrasion of the skin. This is a point which is worthy of the consideration of every clinical physician. Again, it may be necessary to pass a catheter to draw off the patient's urine. Now this may be done in such a manner as to injure the urethra, which may be in a very tender state, and cause ulceration and severe symptoms, and even death. Use, then, a soft catheter with all possible care and delicacy. In summing up he observed that the recovery from typhoid is dependent on attention to the smallest matters.

The time will come when this disease will become rare, or even die out.

We must save the patient's strength from the beginning, and not trust to medicines to cure the disease. The materia medica of fever is lessening every year.

Sir William would prefer to carry any one through typhoid fever by wines and soups and fresh air, rather than by the use of drugs.—*Lancet, June* 29, 1872, *p.* 896.

2.—ON THE EXTINCTION OF TYPHOID FEVER IN THE MILLBANK PRISON BY THE DISUSE OF THAMES WATER.

By Surgeon-Major A. C. C. De Renzy, Sanitary Commissioner, Punjab.

It is instructive, as an illustration of the difficulty of discovering the true cause of sickness, to note that, of all the many distinguished physicians and men of science who were consulted from time to time about Millbank, no one appears for the first thirty years of its existence to have had a suspicion that the water-supply was in any degree answerable for the epidemics of fever, diarrhœa, and dysentery that visited the institution so frequently. During the inquiry conducted for many months by the two Select Committees of the House of Commons in 1823 and 1824, the state of the water-supply was not once mentioned. The earliest mention of any suspicion of the water-supply is found in the Report of the Directors of Convict Prisons for 1852. At page 123, Dr. Baly says: "It was determined to put to the test of experiment an opinion more than once mooted respecting the cause, not only of the cholera, but also of the other kinds of bowel complaint which, in a mitigated degree, are almost constantly present in the Millbank Prison. It had been suggested, namely, that these diseases are produced by the Thames water, which the prisoners drink; and although for some years this water has been well filtered within the prison and freed from all obvious impurity, it was still possible that matters in solution in it produced a deleterious effect." It is evident from his later reports that this opinion had little weight with Dr. Baly; but, notwithstanding, he strongly recommended that it should be put to the test of experiment. His own opinion, which appears to have been shared by every physician who was consulted about the prison, was expressed as follows in his report for 1849, and repeated in several later reports:—"The causes of the general liability of the prisoners to fever," he says, "appear to be the low site of the prison, the proximity of low and ill-drained ground, open sewers and manufactories which fill the air with impurities, the construction of the building, which impedes the free circulation of air through it, and the proneness to suffer from general causes of disease which is produced by the state of imprisonment." Dr. Baly was evidently surprised at the remarkable results that followed the introduction of a pure water-supply in August, 1854. He could not believe that the sudden cessation of cholera that followed in six days was due to the change of water-supply, but the continued healthiness of the prison in after years gradually shook his scepticism, though some traces of it remain apparent to the last. In his report for 1855, he writes: "One of the special tests of the health of Millbank prison is the degree of prevalence of diarrhœa, and there have been fewer complaints on account of this disease than in former years. This improvement in the health of the establishment began toward the close of 1854. It followed quickly upon the substitution of the artesian well-water for the Thames water, and it is, most probably, in great part due to the greater purity of the water at present in use. It may be hoped, therefore, that this improved health of the establishment will at all events to some extent be permanent. But it is not to be expected that the convicts in Millbank Prison will suffer as little from diarrhœa, dysentery, and fever, as the convicts in prisons differently situated." In his report for 1856 a further advance of opinion appears. He says: "I have again to report that the health of the prison is satisfactory, and that those diseases which have hitherto appeared to be inseparably connected with locality have been less frequent. These favourable results are, I believe, attributable in great part to the purity of the water with which the prisoners are now supplied. I have, therefore, a strong hope that they will be permanent." It may here be stated that Dr. Baly mentions no other cause to which the improvement in the health of the prison could be attributed.

Dr. Guy, who succeeded Dr. Baly in the medical charge of the prison, expresses his surprise that, although the Thames was unusually offensive in 1859, the prison was unprecedently free from sickness. In 1862 Dr. Guy reports that "the male convict population are at least as healthy as any other population with which it can be compared, and that the female convict population suffers but little by comparison with the population out of doors." In 1871 the present able medical officer, Mr. Gover, reports that "the prisoners have continued to be free from every form of disease which could call the sanitary arrangements into question, as free as if the prison occupied the healthiest site in the kingdom." These extracts show very strikingly the permanence and the thoroughness of the change that has taken place in the health of the prison.

The sanitary history of Millbank appears to me to warrant the following conclusions:—

1. That the extinction of typhoid fever, and other diseases of the same class, is quite within the range of practicability.

2. That the extinction of one class of zymotic diseases is not necessarily followed by zymotic diseases of a different class. For example: it is supposed that the increased prevalence of scarlatina and measles of late years is due to the partial displacement of small-pox by vaccination. The case of Millbank shows that it is practicable to protect a community against every kind of zymotic disease. Ignorance of sanitary science is the great obstacle to the extension of this protection to the free population.

3. That since some of the ablest physicians in London failed for many years to detect the true cause of the unhealthiness of Millbank prison, and assigned causes for it which later experience has found to be unconnected with it, the probability is that a similar error is frequently made elsewhere, and that the prevalence of some zymotic diseases is ascribed to locality, malaria, heat, cold, variations of temperature, moral depression, and other intangible influences which would be entirely removed by the general disuse of impure water.

4. That as it required long years of observation to establish the noxious influence of Thames water in Millbank, even when well filtered, under conditions

very favourable for detection, we should be cautious in accepting the opinion, based on the results of chemical analysis, that the use of that water by the population of London is free from danger.

5. That the vital statistics of prisons, carefully kept and tabulated, would be of the greatest value as data for the investigation of the causes of disease. Those now published by the directors of convict prisons are excellent. The sanitary information given in the reports of the Inspectors of Prisons is of the most meagre description, and of no practical use.—*Lancet, June* 15, 1872, *p.* 820.

3.—THE TREATMENT OF ENTERIC, OR TYPHOID FEVER.

By Dr. James Little, Physician to the Adelaide Hospital, Dublin.

Next to early confinement to bed, which perhaps more than anything else lessens the severity and risk of the fever, I rank the rigid exclusion of animal broths and jellies from the food, as tending to keep the disease mild. On this point I find myself quite at variance with the text-books in which such articles as beef-tea and Liebig's essence of meat are recommended. Dr. Hudson in his Lectures on Fever insists on the liability of all kinds of broths to increase the diarrhœa, and I cannot but attach the utmost importance to this matter, as I have repeatedly seen a patient who was passing four to six stools on a milk diet have eighteen or twenty during the day and night after he had taken beef-tea. Milk should be the chief article of diet in enteric fever. Thirsty patients sometimes object to its mawkish taste, and I generally, therefore, add ice to it, and a little lime-water in cases in which it returns curdled. Junket or renneted milk given before it has separated into whey and curd, rice milk, custard, baked custard in small quantity, rusks and hot milk, and blanc-mange, generally afford sufficiently varied ways of giving milk. Freshly made chicken jelly is less liable than beef-tea to increase the abdominal symptoms, and I use it in those cases in which milk, even with lime-water, disagrees; but in my experience such an occurrence is very rare, and when encountered is usually in a person chronically dyspeptic. For years I have made the administration of two or three cups of really good tea or coffee between daybreak and two in the afternoon a regular part of the treatment of every case of fever, unless there was in the state of the nervous system some evident contra-indication. I did this in consequence of the well-known observations of Dr. Parkes on the effect of coffee in increasing the elimination of urea in fever, and I am satisfied that both it and tea lessen drowsiness and prostration, and increase the secretion of urine; once or twice in the day they may be given, poured upon a well-whisked egg, and thereby an additional means of nourishing the patient is obtained. I agree with those who consider alcoholic stimulants in any quantity seldom needed in enteric fever.

Cold baths I have systematically employed since Dr. Cuming, in his Report on Medicine in this Journal, (May, 1869,) drew attention to their use in enteric fever. I have not given them at such short intervals as recommended by Jürgensen and by Bartels and Liebermeister; three, or at most four are given in the twenty-four hours. In the hospital we have full-sized baths, which run on castors; one of these is brought to the bedside half full of water at 75° Fahr., and if the temperature of the patient exceed 102° Fahr., he is lifted out and laid in the bath; he is kept in it for a period varying from five to fifteen minutes, and then quickly dried and put back to bed. The bath is usually most grateful to the patients; they often say it makes them feel strong, and after the evening bath they commonly fall into a sound sleep. I have used it with manifest benefit where cooing and wheezing râles existed in the chest, and where deficiency in the percussion resonance posteriorly and muco-crepitus indicated postural stasis in the lungs; but I have never used it when there was hemorrhage from the bowels, or such pain as to justify the fear that peritonitis existed. There is sometimes slight chilliness in the extremities after it, and a little shivering. This indicates that the bath should not be a prolonged one, but does not forbid its use. Twice, however, I have considered it unsafe to continue the baths, once because a marked shivering followed, and once because the patient was alarmed by it. In cases in which the disease is running a mild course I only give one bath in the day, at the height of the usual evening paroxysm of fever.

By a dietary such as I have described, and by the systematic employment of the baths, I am convinced the severity and danger of enteric fever are greatly diminished, and the occurrence of any of the serious accidents incidental to the complaint rendered very rare; but I do not believe that its duration is appreciably shortened.

Besides these means there are others which I have found of material benefit when certain conditions were present.

When during the first eight days the face is flushed and there is headache, a high temperature and a thickly coated tongue, and when the evacuations, three or four in the twenty-four hours, are neither very large nor very liquid, a dose of calomel, from four to six grains, perceptibly lessens the heaviness of the fever. I have sometimes given the calomel the second time, after an interval of a day or two; but never oftener; it increases the evacuations during the twelve hours after its administration, but never in my experience sets up troublesome purging.

In enteric fever it is not uncommon to find a patient lying on his back, perceptibly impeded in his breathing, his abdomen tumid and projecting, but not markedly tender, and on inquiry it will be found either that the bowels have not acted for twelve hours, or that though the stools are frequent, only a very little fœcal matter with wind passes each time. In such a case great relief is obtained by giving a draught containing two drachms of castor oil, with one or two of turpentine. If for any reason the physician hesitates in ordering this, he may have a warm water enema administered, but the draught relieves much more completely.

In my experience poultices and fomentations have not proved so useful as their constant recommendation by authors led me to expect; their weight, and the bandaging necessary to keep them properly applied, render them anything but grateful to most patients, and I now seldom employ them except when the abdomen is tympanitic, in which case the turpentine stupe is of undoubted utility.

Since I have kept my patients rigidly to the diet I have mentioned, I have not often found it necessary to give medicines to check looseness of the bowels; three or four actions in the twenty-four hours seldom do any harm; when it is necessary to interfere I have found by far the most useful remedy a pill, the use of which Dr. Hudson some years ago suggested to me; it contains one-sixth of a grain of carbolic acid, one-sixth of a grain of opium, and three grains of bismuth. This combination I have found so admirable for moderating diarrhœa and tympanites that I have seldom employed any other; two, three, or four pills may be given during the day and night; of other remedies sulphuric acid is, I think, the best.

Hemorrhage from the bowels is also rare when milk diets and cold baths are employed; when it occurs, gallic acid, a scruple every second or third hour, and turpentine were the remedies upon which, until lately, I relied; in consequence, however, of the power of arresting hemorrhage which ergotin has recently been shown to possess, when administered hypodermically, I some weeks ago made up my mind to try it in the hemorrhage of typhoid, as soon as a case presented itself, and as far as the experience of a single one goes, I have reason to be well satisfied with the experiment. On the morning of the fourteenth day of enteric fever, blood appeared in the discharges of a patient now under my care in the Adelaide Hospital; when I visited her at noon I found more than a pint of clots had come away, and while I was in the ward more than half a pint of pure blood, partly clotted and partly liquid, was passed; at the same time the features became sunken, and the extremities cold. I then injected five grains of ergotin, and repeated the injection at three o'clock. Within half an hour of the first injection about three ounces of blood escaped from the bowels, but none came again until four o'clock the following morning, when half a pint of clots escaped, and a third injection was used; the only other treatment employed during that day and night was the application over the ilio-cæcal region of an ice-bag. There was no further discharge of pure blood; the three or four next stools were, however, blackish, and as a precaution three twenty-grain-doses of gallic acid were given on each of the two following days.—*Dublin Journal of Medical Science, May,* 1872, *p.* 371.

4.—ON THE USE OF STIMULANTS IN SEVERE CASES OF FEBRILE AND INFLAMMATORY DISEASES.

By Dr. Lionel S. Beale, F.R.S., Fellow of the Royal College of Physicians; Physician to King's College Hospital.

It has been found that persons suffering from fever will bear alcohol without any narcotic intoxicating effect whatever being induced. It has been demonstrated that a large amount (upwards of twenty ounces of French brandy in twenty-four hours) does not cause delirium in fever patients, does not produce inflammation of the brain, nor increase bronchitis or pneumonia if present. Neither does the alcohol augment dyspnœa even when very urgent. On the other hand, it is a fact that patients suffering from fever complicated with severe and extensive inflammation of internal organs—lungs, pleura, pericardium—have progressed favourably towards convalescence while taking brandy at the rate of more than twenty ounces in the twenty-four hours.

[There continues, nevertheless, to be considerable difference between the amount of stimulants prescribed in the treatment of such cases by different medical men. Some never go beyond two or three glasses of wine for patients in whose cases others would prescribe very large amounts, having learnt that by this means the period of convalescence is shortened and the patient makes a better recovery.]

Considering the grave importance of this practical question, it seems to me desirable that it should be fully discussed; and at the risk of being considered tedious, I propose to pass in review some of the facts and observations which, as I pointed out long ago, justify the administration of alcohol, and enable us to form some notion concerning the precise manner in which this substance acts advantageously in some cases of fever. In this way I hope to be able to support and explain the favourable results of clinical experience. Of the scientific arguments many are based upon minute observations of my own, extending over many years, and which were carried out without reference to the question at issue, and indeed without the thought that they might at some future time assist in elucidating it.

Objections to the Administration of Alcohol in Inflammation.—It is interesting, if in some respects painful and depressing, to study the wonderful alterations which have taken place in our views concerning the nature and treatment of important general pathological changes. The process called *inflammation* lies at the root of many of the disorders—acute and chronic—from which civilized man and the higher animals suffer. Inflammatory action is, as it were, the point round which medical theories revolve, and differences regarding the nature of the phenomena comprised under inflammation have led to divisions upon the most important questions of practice, and have caused the greatest differences of opinion regarding the proper treatment of disease. Inflammation is a subject which always excites intense interest, and even now the nature of the changes taking place cannot be discussed without much feeling. The calm necessary for the steady prosecution of scientific discovery is not unfrequently disturbed by the vehemence and warmth of debate as to the proper interpretation of observed facts.

The term "inflammation" involves increased action; and in all inflammations it is true that there is increased action. In order to combat this undue action and reduce the burning activity of the inflammation, we used to be taught to give remedies which depressed the heart's action and reduced the patient's strength.

But it has long been observed that many forms of inflammation are only seen in systems already reduced and exhausted by disease, misery, or privation. There are many cases in which frequency of pulse, violent delirium, extreme prostration, and all those symptoms known to accompany extensive inflammatory action, are associated with a general state of the system which can hardly be made lower than it is without great risk to life. Nevertheless, with such confidence was the truth of the old combustion theory of inflammation believed in and taught, that the efforts to quench the fire or to moderate its intensity so absorbed the attention of the physician, that there was danger of losing the patient ere efforts employed to check the disease could prove successful.

Oftentimes in medicine and in science have facts been explained by theories which had never been deduced from the results of experiment; and when new facts opposed to a theory had been demonstrated, men have sometimes said the facts could not be true, and have persisted in acting upon the theory, at the same time appealing to the dogmas upon which the theory was based to confirm them in the action which, it is to be feared, they had already determined to take. In days long gone by, stimulants had from time to time been given by intelligent doctors, in low conditions of the system accompanied by local inflammations; and in many cases when the patient felt better after taking wine, practitioners in olden time have even allowed a repetition of the practice, although they felt conscious it was against what was regarded by them as sound principles of treatment which they dared not doubt. The favourable action was ingeniously explained by the discovery of some idiosyncracy or peculiarity in the constitution of the individual patient, instead of being attributed to changes consequent upon the action of the stimulant upon the phenomena of a particular abnormal state.

Changes in Practice.—By degrees, however, it came to be observed that stimulants seemed to act favorably in very many cases in which their administration was quite opposed to theory, and was in direct antagonism with the doctrines then taught; and at last it was admitted that experience was to be trusted, and that the doctrines formerly taught could not be true in all cases. Still more recently scientific observation and experiment have demonstrated that facts which had been appealed to had been misinterpreted and misunderstood, and that a plan of treatment at variance with the one formerly popular, and in harmony with that now followed out, was really indicated. No one who knows what changes are taking place in fever or inflammation would say that he objects to the exhibition of stimulants *because* some kind of inflammation or local fever is present. In fevers, which are in reality but general inflammations, the pulse has been observed by hundreds of practitioners to diminish in frequency, delirium to give place to calm consciousness, and the feverish state cease while the patient is taking stimulants. Forty years ago such conditions would have been treated by bleeding, calomel, antimony, and lowering remedies.

Dr. Graves, of Dublin, who, like Todd, had been a teacher of physiology, advocated, as long ago as 1833, support in the treatment of fever; and a stimulating system had been carried into practice by Dr. Blakiston during the epidemic of influenza at Birmingham, about the year 1837. But it was reserved for Dr. Graves' pupil, Todd, to carry out this stimulating plan of treatment to its fullest extent, and to apply it more generally. During many of the earlier years of his life, Dr. Todd treated cases of acute disease like most practitioners of that day; and in his oldest case-books are records of cases of acute pericarditis which were bled and treated by mercury or salivation; cases of pneumonia which were treated by bleeding and tartar emetic; cases of fever in which a supporting plan was very hesitatingly and very imperfectly carried out. Slowly and gradually his treatment was much modified; and at length he became a strong opponent of the doctrines upon which the so-called *proper treatment* of inflammatory action was supposed to be based. Pericarditis and peritonitis were treated with opium without the mercury; stimulants were given, and the lancet was completely laid aside. Pneumonia was combated by counter-irritation and soothing poultices, and the skin and kidneys were made to act freely. The strength was supported; nourishing food was given; and if the powers of the patient flagged, brandy was administered, at first in small doses, but in many bad cases it was increased to considerable quantities. Desperate cases of low fever and extensive internal inflammation were treated by very large quantities of stimulants, the amount being varied from time to time according to the symptoms present and the progress of the case; but the proportion was not limited by any inflexible or arbitrary rule.

It is, however, only during the last twenty-five years that we have actually demonstrated that alcohol administered in small and oft-repeated doses does not *excite or increase the inflammatory process, and that inflammation may cease while a patient is taking considerable quantities of alcohol;* but even to this day there remain not a few who are not convinced of the truth of these remarks. Some have fallen into the error of supposing that practitioners who advocate the use of stimulants in fever, order large quantities in every case. Practitioners have been accused of giving brandy in a routine manner, inconsiderately and indiscriminately. But this is a very grave charge to make, and ought to be supported, by those who prefer it, by reference to special cases. Mild cases of fever and inflammation were treated by Dr. Todd without stimulants altogether, or with very moderate quantities; but as this physician was naturally desirous of treating as many desperate cases of febrile disease as possible, a very large number of the worst forms of acute disease admitted into the hospital were placed under his care. The curious argument was adopted by some, that because very large quantities of alcohol were administered in some exceptional cases, equally large doses were given by him in all cases.

Unfortunately the question of stimulation is one which has not always been considered upon its merits only. The zealous opposition to a particular practice upon religious, political, or moral grounds may, without due care upon his part, quite unfit a man for the investigation of the effects of that practice upon the tissues of the living body under the varying circumstances of health, disease, climate, age, rest, anxiety, labour, etc. Such opposition ought to be discouraged.

Objections on account of the large quantity of Stimulants given.—Many objections have been offered to the "enormous amount" of stimulants given; but these objections do not rest upon actual evidence, and the arguments adduced against the system pursued have been satisfactorily answered. It seems never to have occurred to some, who have not hesitated to state the exact quantity of alcohol which in their opinion should never be exceeded, that an amount which might be excessive if given to a person weighing six stone, would be but a moderate dose, and perhaps insufficient, in the case of one weighing three times as much. In this matter it is wonderful that people who pride themselves upon the practical tendencies of their minds, instead of allowing themselves to be influenced by facts and reason, should act as if every individual were exactly alike and had been cast in the same mould. Some persons are better treated without alcohol, while others, suffering from the very same disorder, require a good allowance of stimulant. The difficulties of explaining this and many familiar facts are great indeed—perhaps insurmountable in the present state of our knowledge. Many of us have remarked how readily some persons when exposed to contagion contract the disease, while others altogether escape, or if attacked, progress favorably in spite of circumstances the most adverse. Original hereditary defects affecting the organs of circulation and the nervous system, particularly weak heart, will doubtless account for some of the cases we have observed. There is reason to think that many children who die early might have reached old age if they could have been preserved up to the period of early youth; while there is no doubt that in other instances adolescence, or a still later period of life, constitutes the critical period when exposure to the influence of contagious poison might be more disastrous than at any other time of life. Such considerations must always influence our judgment in determining the proper treatment, especially as regards the quantity of alcohol. In the regulation of the amount of food for prisoners, the inmates of workhouses, hospitals, and charitable institutions, there is too great a desire on the part of the authorities to adopt uniformity; as if every individual required precisely the same quantity. The consequence is that a diet which is low for some is more than sufficient for others. Some will be half-starved while others will be well fed—perhaps over-fed. Some of our hospital authorities are painfully inflexible in these matters, and are continually trying to discover a diet that shall equally suit patients of all ages and every kind of disease. The diet-tables are changed every few years, and the physicians and surgeons continually blamed for ordering extras. Under the uniformity system it is clear that to the little people and the light weights is accorded a not perfectly fair advantage in the struggle for existence. It is of some importance for the physician, among other particulars, to take carefully into his consideration, when prescribing and regulating the proportion of food and stimulant, the weight and vigour of the individual patient. For although it is true that in proportion to their weight small animals require much more food than large ones, a heavy man should, as a general rule, have a more liberal diet than a light one; and in apportioning the quantity of stimulant to the sick, this fact must not be neglected. But it must at the same time be borne in mind that by habit and other circumstances some persons have been led to take, and hence require, a larger proportion of food and stimulants than others of the same weight.

In low diseases the quantity of stimulants required during a short period may be very large; indeed, the patient's life seems sometimes to depend alone on the frequent doses of alcohol (occasionally as much as an ounce or even two ounces an hour) which are poured into the stomach and taken up by the blood; and it is remarkable that as long as the case does well the stimulant seems to be absorbed almost as fast as it is introduced into the stomach: a little escapes in the urine, in the breath, and perspiration, but by far the larger portion is used up in the system, and in two or three different ways helps to keep the patient alive at a time when the disease places him in the greatest jeopardy.

It was pointed out more than twenty years ago, that in some cases the period of convalescence was much shortened; in cases necessarily fatal, life was prolonged; and it is believed that many desperate cases of low fever, pneumonia, acute rheumatism, etc., have been saved by the administration of large quantities of stimulants. If a collection could be made of some of the most serious instances of febrile diseases that have recovered under alcohol from the practice of a considerable number of medical practitioners, I feel sure that so strong a case would be made out in favour of this mode of treatment that it would be generally adopted. Moreover, there are cases which have injudiciously been "given up" by the doctor that have recovered under the administration of stimulants, and it has occasionally happened that the delirious state has been relieved by an act performed by the patient in his delirium. Dr. Winn sends me the following interesting remarks in connection with an instance of this:—"As regards the use of alcohol in disease, I learnt a lesson when a student which I have never forgotten. I was attending the Fever Hospital at Glasgow, a city which was then quite a hotbed of fever, and I went there with my mind fully imbued with the antiphlogistic theories. Imagine my surprise on finding that the chief remedy employed, and successfully too, at that hospital, in the worst cases of typhus, was whiskey in frequent and large doses. I can now recall one case in particular—that of a patient in a state of acute delirium, whose head became quite clear after imbibing a bottle of whiskey in about twenty-four hours!"

It may then be regarded as certain, that in a number of cases advantage has resulted from giving very large quantities of stimulants. Several remarkable instances will be found reported in Dr. Todd's "Clinical Lectures"; but among the most striking are the two cases already alluded to, which have been recently recorded by Dr. Wilson Fox. Alcohol is the most powerful remedy we possess, and probably the only one by which we are enabled to save life in desperate cases of fever.

When considering the circumstances which lead to death in severe cases of fever, I showed that the failure of the heart's action, the alteration in the composition of the blood, and the obstruction of the capillaries, and the consequent interference with the process of nutrition, all contribute to bring about a fatal result. Now, in slight cases frequent doses of alcohol tend to prevent these occurrences, and when the attack is severe, to mitigate its severity, to postpone the occurrence of the dangerous phenomena, and to prevent them from progressing to such an extent as to render a fatal result probable.

Alcohol, then, exerts a twofold action when given in cases of fever. It acts *directly* upon the nerves of the stomach, and through these excites almost instantly increased contraction of heart. The less *direct* action of alcohol is much more complex, and occurs more slowly; for before it can exert the indirect infl ence I refer to, it must be absorbed by the blood and circulated with it to a parts of the body. Although I have drawn attention to the facts upon which m views concerning the important indirect influence of alcohol are based, the su ject is of such vast practical importance that I shall offer no apology for pass in review the several scientific arguments, which it appears to me prove concl sively the way in which, by the judicious use of this most important rem the saving of life is effected. But first, a very few words concerning the dir action of alcohol.

1. *Direct Action of Alcohol in keeping up the Heart's Action, and promot the Capillary Circulation.*

Now, as to the probable action of alcohol in saving life, and retarding a f result in desperate cases of fever and extensive internal inflammation, I remark that its value in exciting the heart to more vigorous contraction is ad ted by all. The fact is in accordance with the actual experience of many of effect of stimulants upon themselves, and physiological experiment has pr that by the action of alcohol upon the nerves of the stomach the heart's acti accelerated. The value of stimulants in promoting the capillary circulation been recognized by several physicians, but Sir D. J. Corrigan especially dwelt upon the great importance of giving alcohol in fever, because it main the flow of blood through the minute vessels of the tissues of the body. In "Lectures on the Treatment of Fever," published in 1853, and containin results of great experience and many years of careful observation, occur following passage, which deserves to be quoted at length:—

"Ask yourselves for what is it in typhus fever you prescribe wine? for delirium? No. Is it to prevent its approach? Again, no. Do you it for a dry tongue? Certainly not. What is it that, as you cons patient's state, would lead you to think of its employment? Is it not the of the function of circulation, taken as a whole, indexed to you by the pul the one hand, and by the state of the capillary system of circulation in skin on the other?

"It is for this you give it. It is the specific remedy directed to reme general lesion of the function of circulation, and hence in its administr you may give it whether there is or is not delirium; for delirium may be ent or absent in a case requiring its exhibition for the function of circul You should give it indifferently whether the tongue is moist or dry; f tongue may be either, and yet wine may be required; and hence the ton becoming moist is not an indication that you may dispense with its use, its continuing dry a sign to make you discontinue it. You may give it w soft abdomen, or with an abdomen tympanitic, for similar reasons. Yo giving wine, recollect, as the specific remedy for the lesion of the func circulation (remember always, comprising under this the capillary and circulation); and by the state of pulse, and changes in the colour of the læ, you are to judge of the necessity of continuing, decreasing, or augm its dose. Under its exhibition you will see the vessels of the conjun tract, the maculæ become rose-coloured, and the patches of skin on dep portions of the body lose their dark livid hue. Keep this then in min lesion in fever for which you give wine, is the lesion of circulation; an function from debility require it, you must give it under all circumst derangement of other functions."

2. *Indirect Action of Alcohol on the Blood and on the Bioplas Tissues.*

In order that a correct idea may be formed of the manner in which rect action of alcohol upon the constituents of the blood and upon the in fever and inflammation is effected, it is necessary to direct the read tion to some questions of scientific detail, some of which may appear remotely connected with the subject, but which are nevertheless i partly because they indicate precisely the change which is effected by t partly because they enable us to correct erroneous theories which h erto been acted upon. And first as regards the conclusions formerly

and still to some
inflammation.

Of Bleeding
giving and
themselves to
of the highest
been correctly
ment. Modern
tertained with
and modern
like every other
correctness, but

The principles
vocated and carried
proved to have
mation, even
tion and exper
pose of reducing
same class, to
been proved
posed to be
by violent bleed
serious than
he is bled only
laries.

The blood
which carries
abstraction of
remedies wh
the blood is
sues of the
and that in
morbid chang
power to the
power is dim
in the blood—
assuming that
by any fluid
Nor is it pr
from any
power at
the term
albuminous
circulating
withdrawn

in pus and less
to coagulate or
its growth.
ms advanced in
disease is a *defi-*
quired to coun-
fanciful, as is
make up for the
ures in disease
y to day, still
vital power,"
s the phenome-
the wound with
surface just be-
ases the vitali-
these measures
death live and
d life is really
s to the healthy
very reverse of

was deficiency of
is there of such
he may be deliri-
be weak; and he
kness, or inability
n, or what we call
vital power? It
there is "excess of
se there is deficien-
pressed, and we must
active, and must be
s, and the same words

patient is low or weak than
the *vital powers.* The for-
ory. We talk of excess of
d as to what we mean by the
nge, to increased vital activity,
which have been accounted for by
ally depend upon an undue manifes-

in these conclusions I differ materially,
views generally entertained. Men may
they differ materially in opinion as to why
in a given case. But when good practice
always great danger of the practice being
thrown. This in part explains why we vacil-
to the other, and why, to some extent, we
Earnest men not unfrequently are found to
management of disease; and in the
arrived at from actual expe-
these conclusions were
But why, for example,
cases in which it
which depletion
And, on the
ulation in
quite true
supply

plasm,

by the blood does not transmit life to the tissues; for, as I have shown, every tissue contains in its substance matter in a state of active vitality, or *bioplasm.* The pabulum that passes from the vessels and permeates the lifeless tissue is inanimate. It comes into contact with the living matter; and certain of its constituents then acquire at once vital properties, powers, or endowments. By contact with and absorption into the living, life is communicated to that which was lifeless. There is no reason to suppose that living matter (for instance, the so-called "nucleus" of a cell) exerts any influence upon matter at a distance from it; but it appears probable that in all cases the changes which occur in nutrition are simply these:

The inanimate pabulum permeates the inanimate tissue (cell-wall, intercellular substance), and comes into contact with the living or germinal matter or bioplasm. Certain of the inanimate constituents of the pabulum become bioplasm. Particles of the living matter or bioplasm after a time undergo change—in fact, die, and become gradually converted into inanimate "cell-contents," "cell-wall," or "intercellular substance." These inanimate *formed substances* may accumulate and undergo condensation and other physical and chemical changes, or they may be resolved by the action of water, oxygen, and the like, into new substances as fast as they are produced. Such new matters produced by the agency of the bioplasm of "gland cells" may pass into a tube or duct, and in many cases constitute a secretion.

The rate at which bioplasm grows and is reproduced is determined solely by the facility of access of the proper pabulum; so that, if nutrient matter comes into contact with the living matter readily, the living matter increases rapidly. In short, the more it is fed, the faster it grows. The *power* of growth on the part of living matter remains the same, but actual growth always occurs under certain restrictions. The restrictions or impediments to the access of nutrient matter vary in different cells, and in the same cell at different periods of its existence. Alcohol and many other substances cause changes which result in increased impediment of access of nutrient matter.

Alcohol is not a Food, but is absorbed as Alcohol.—It is probable that whenever alcohol is taken, a certain proportion, which increases as the dose is augmented, passes into the blood and circulates with that fluid as alcohol. It may permeate the tissues and produce changes in them. Many other active agents are taken up by the blood, and under certain circumstances produce a direct action upon the tissues. These substances may then undergo change, and perhaps be completely decomposed, and their elements excreted in an altogether different state of combination from the body. Being transmitted by the blood to different parts of the body, such soluble materials may modify the growth of tissues and affect the rate at which growth takes place. Nay, we know that by certain soluble matters introduced from without circulating with the blood the formation and growth of tissues may be actually prevented. For the further elucidation of the matter under consideration, it is desirable to refer briefly to the varying rate of growth of bioplasm under altered conditions of life.

Of Slow and Rapid Growth.—We can tell at once, by the characters of a cell, whether it has been growing quickly or slowly. Whenever the outer part of the cell (formed material) is firm and hard, and not very permeable to nutrient matter, the growth must have been slow. Where, on the other hand, the envelope is very thin, or where there is no envelope or cell-wall at all, the greatest facilities for rapid growth exist. Contrast the pus-corpuscle, consisting almost entirely of bioplasm, which has grown perhaps in the course of a few hours, with a fully formed cuticular cell in which the bioplasm is surrounded by a very thick layer of slightly permeable cuticular substance. The restrictions under which the growth of the bioplasm of the last is carried on are far greater than those which limit the growth of the first. But anything which renders the wall of a slow-growing cell more permeable will facilitate the access of pabulum, and its bioplasm will then increase more rapidly. Thus rapidly growing bioplasm may spring directly from bioplasm which has been growing very slowly. Pus may result from the rapid growth of the bioplasm of epithelium, fibrous tissue, nerve, or other tissue which has been growing very slowly. Cancer grows faster than healthy epithelium or other normal tissue, but not so fast as pus. Epithelial cancer is less permanent as a tissue, and grows more quickly than the normal epithelium, but it is more lasting than pus and less quickly produced. On the other hand, anything which tends to coagulate or harden bioplasm on its surface will have the effect of retarding its growth.

Disease is not due to Defective Action.—From the considerations advanced in the last few paragraphs it must be clear that the doctrine that disease is a *deficiency of action* must be erroneous. The idea that support is required to counteract this tendency to depression of the vital powers is purely fanciful, as is also the notion that something extra must be added in order to make up for the loss occasioned by the diseased state. Although we see structures in disease growing so fast that difference in bulk is perceptible from day to day, still pathologists continue to talk of "*deficiency of action*," "*defective vital power*," "*diminished vitality*," as if it was certain that by these phrases the phenomena of disease were to be explained. The surgeon "*stimulates*" the wound with caustics, and fancies that he "increases" the "*vitality*" of the surface just below; the physician pours in brandy, and supposes that he "*increases the vitality*" of the affected tissues. But it is easy to prove that by these measures many cells that were alive are *killed*, and that those that escape death live and *grow more slowly than before*. This *diminished rate of growth and life* is really what is required—it is indeed the very condition which approaches to the healthy state; but then it is, as compared with the morbid state, the very reverse of "*increased vitality*."

Probably even now most physicians would affirm that there was deficiency of vital power in a case of low pneumonia; and yet what evidence is there of such deficiency? It is true the patient is weak and cannot move; he may be delirious; all his muscles may be relaxed; his heart's action may be weak; and he may be dying of exhaustion; but has it been shown that weakness, or inability to move, or delirium, or relaxed muscles, or weak heart's action, or what we call "exhaustion," are due to diminished vitality, to depression of *vital power*? It is very well to say that in this particular morbid change there is "excess of action," and in that one there is "deficiency," or in all disease there is deficiency of action; in this condition "the vital powers are depressed, and we must give support," and in another "the vital powers are too active, and must be restrained;" but these are, after all, but arbitrary phrases, and the same words are used in very different senses.

Surely, then, it will be more correct to say that a patient is low or weak than to say that he is suffering from a depressed state of the *vital powers*. The former phrase asserts a fact; the latter expresses a theory. We talk of excess of action, and diminished action, before we have agreed as to what we mean by the terms. If we attribute rapid growth, rapid change, to increased vital activity, then most unquestionably do many diseases which have been accounted for by some supposed diminution of vital power really depend upon an undue manifestation of vital action.

Conclusions.—It will be observed that in these conclusions I differ materially, and in fundamental principles, from the views generally entertained. Men may agree as regards practice, although they differ materially in opinion as to why certain measures ought to be employed in a given case. But when good practice rests upon unsound theory there is always great danger of the practice being abandoned when the theory is overthrown. This in part explains why we vacillate from one extreme of practice to the other, and why, to some extent, we seem to work in recurring circles. Earnest men not unfrequently are found to be sceptics upon the question of the proper management of disease; and in the course of years, most valuable practical conclusions, arrived at from actual experience, are forgotten because the theory upon which these conclusions were based has been overthrown and proved to be unsound. But why, for example, may we not retain in practice the depleting process in those cases in which it has been proved to be of service, although the principles upon which depletion was carried to foolish extremes have been proved to be erroneous? And, on the other hand, why may we not continue to carry on the system of stimulation in cases in which stimulants are known to be useful, although it may be quite true that stimulants neither support life, nor give life, nor nourish tissues, nor supply the place of food, nor directly affect the disintegration of tissues?

So far from the abstraction of blood diminishing the nutrition of bioplasm, the process may actually be increased by violent bleeding. The blood that remains becomes weaker, and the watery parts necessarily permeate tissues more readily. Thus rapidly-growing cells, such as exist in the air-cells in pneumonia, grow still faster, because they are supplied more freely with nutrient pabulum. On the other hand, alcohol in several ways interferes with the growth of these bioplasts, and thus tends to put a stop to the "inflammatory process." The results of practice, in fact, support *this* theory: that in low conditions of the system, and by profuse bleedings, the growth of adventitious products is *accelerated;* and that such growth is retarded by alcohol, acids, and some other substances.

Of Support.—Further, as regards the meaning of the term "support," it is necessary to make a few observations. In cases of exhausting disease, we all talk very freely in these days of the importance of *support;* and many physicians would regard alcohol as the most valuable of all kinds of support given. Nevertheless, in these very cases the patient, in spite of all the support, loses many pounds in weight, and in the course of a few weeks or even days; nor is it possible by any known means to prevent this result. And it is a fact that, in many of the worst cases I have seen, although the stomach seemed to do its work perfectly, and the quantities of supporting matter consumed by the patient were very great, the emaciation was extreme. The patient under these circumstances has been kept alive long enough to become extremely emaciated. Such emaciation would not exist if the patient were left to nature, because death would have occurred before matters had proceeded to this extremity. But it does not follow that he has been kept alive by food or by matters that support like food. In these cases, I feel confident that the stimulant is really the agent which has kept the patient alive; for it sometimes happens that patients will not take any form of nutriment, and not unfrequently the stomach will bear whiskey or brandy, and in large quantity, where it instantly rejects beef-tea, milk, and other "nutritious substances." From what I have observed, I think it possible that a patient suffering from low pneumonia, or from a very severe form of continued fever, or acute rheumatism complicated with pericarditis and pneumonia, might be kept alive until the disease subsided by alcohol alone, but not because the alcohol acts like food and supports him and nourishes his tissues. It is certain that the alcohol does not nourish the tissues in the ordinary sense of the word; and if it diminishes the waste of the tissues in these cases, it must be admitted that it is difficult to conceive waste more extreme than that which has taken place while the patient has been taking large quantities of alcohol. But the patient lives; and so many account for the result by concluding at once that the alcohol must be a "*supporter of life,*" although they are aware that this same alcohol, administered in the very same quantities in the healthy state, might destroy life.

There is not a more important question in medicine to be determined than the action of alcohol in disease; for, while it has been conclusively proved that it is not a food and does not directly nourish the tissues, there cannot be the slightest difference of opinion amongst practical men concerning its value as a remedy. We differ widely in our views as to the extent to which alcoholic treatment should be carried in a given case, but almost all agree that in some cases alcohol ought to be prescribed, and in considerable quantities.

Chemical Action of Alcohol.—It seems to me that we should not ignore the probable chemical action of alcohol upon important constituents of the blood. It is scarcely possible to believe that the large quantity of alcohol taken by many patients does not influence the permeating properties of the fluid part of the blood, and cause some chemical alteration in the soluble constituents which belong to the albumen class, besides exerting a local action upon soft and rapidly growing bioplasts. Many of the so-called *tonics* have the property of coagulating albuminous fluids and solutions of extractive matters. Preparations containing tannin, the mineral salts—such as the sulphate and sesquichloride of iron, nitric and hydrochloric acids, and a host of other substances employed as remedies, that will occur to every one—possess this property, and render solutions containing albuminous and allied matters less permeable, perhaps by increasing their viscidity. The favourable action of such remedies may be due to their direct influence on the fluid constituents of the blood. They, no doubt, also cause a reduction in the rate at which blood-corpuscles are destroyed, and at the same time they tend to render the walls of the blood-vessels less permeable to fluids.

But, of all the remedies we possess, I believe alcohol acts most rapidly in this way, and in particular cases most efficiently. The properties alcohol possesses of hardening animal tissues and of coagulating albuminous fluids are well known; and these properties must not be forgotten when its effects in the animal body are discussed. Of course, when absorbed by the blood of a living person, alcohol does not actually *coagulate* the albuminous matter; but it probably renders it less fluid and reduces its permeating property. Alcohol interferes with the disintegration of blood-corpuscles; and in cases where this is going on very rapidly, and where fluid is passing through the vessels in considerable quantity, in consequence of the thin vascular walls themselves being stretched and rendered too readily permeable to fluids, alcohol is likely to be of service; but where these changes are proceeding very rapidly, and the patient's strength is fast ebbing, it may save life.

We may therefore explain the beneficial action of alcohol without assuming that it is a food and contributes directly to the ordinary process of nutrition. Nay, if it merely filtered through the bloodvessels, and left the body by different emunctories as fast as it was introduced, we could account reasonably for the good effects we frequently observe when alcohol is given in certain forms of disease.

Action of Alcohol upon Growing Bioplasm.—If there be a little abrasion of the cuticle, around which the skin looks red and angry, the neighbouring tissue being hot, swollen, and painful, the capillaries distended so as to produce bright redness, it will be found that the occasional application of a drop of alcohol to the affected part will in the course of a single hour produce great changes. In and around such a spot, it is quite clear that we have not *diminished*, but *increased* action. Numerous small particles of living bioplasm ("cells") are receiving an unusual quantity of soluble nutrient substances, and are in consequence multiplying rapidly in the deep layers of the cuticle. The bioplasts of the nerves, capillaries, and connective tissue of the cutis are larger than they were in the healthy state; the living matter is growing, dividing and subdividing into smaller portions, which will grow and again divide and subdivide. In the capillaries, and just external to them, are numerous white blood-corpuscles, varying in size from small points to particles having the ordinary dimensions of these bodies. These, like the living bioplasts of the tissue, are rapidly increasing in size. The capillaries are gorged with blood, and the thin walls of many of them are stretched to the utmost. Now, what happens when a drop of alcohol is applied to such a sore? Momentary pain, followed in the course of a few minutes by great relief, or complete cessation of pain, and diminished vascularity. But how does the alcohol bring about these striking changes? If alcohol be added to any serous fluid, as is well known, the albumen is precipitated. If delicate masses of bioplasm are placed in alcohol, and afterwards examined under the microscope, every one knows they will appear "very granular," and they will have become shrunken and altered much in form; and it will be found that they will resist disintegration by pressure to a greater extent than in their natural state. By the action of alcohol the surface of a wound is much altered, and it soon becomes covered with a dry crust. This results from the hardening effects of the alcohol. Some of the rapidly growing particles of bioplasm are quite destroyed, while others become surrounded with an envelope of hardened matter, which prevents the possibility of their absorbing nutriment and giving rise to new particles, and growing and multiplying as rapidly as before. Not only so, but the permeating power of the nutrient fluid itself is reduced by the tendency of the alcohol to coagulate it. The most superficial of the particles of bioplasm would be destroyed by alcohol, though not so quickly, perhaps, as they would have been by the actual cautery, nitrate of silver, sesquichloride of iron, sulphate of copper, etc.

Of the Action of Alcohol on the Vessels of an Inflamed Part.—Next comes a more difficult question for consideration: How does the alcohol cause the vessels of the inflamed part to contract, and permit the flow of less blood through them? If we press upon the distended vessels of an inflamed part, as is well known, the blood is driven out of them, and the skin becomes quite pale; but the moment the pressure is withdrawn, the redness recurs, and exhibits *precisely the same tint* as before. From this it is clear, not only that the capillaries are unduly distended, but that the calibre of the small arteries through which the blood is distributed to them is much larger than in the normal state. Besides this, we are able to prove by this simple experiment that the vessels may be maintained for a long time of a given calibre. Such a state of things can only result from a certain regulated but definite influence upon nerve-centres which govern the calibre of the small arteries. The temporary change induced in the nerves can be maintained at one definite degree for a considerable time. In this way the quantity of blood permitted to flow through the capillaries in a given time is regulated and varied within certain limits. The mechanism is such that a small artery is made to assume and to retain for a longer or shorter period a different calibre, although this may be momentarily altered by artificial means.

Now, I believe that the alcohol passes through the walls of the capillaries, and acts directly upon the nerves, which I have shown are distributed just external to them. By these *afferent* nerves the nerve-centres are influenced, and in consequence the intensity of the current transmitted by the vaso-motor nerves of the small arteries is modified. That alcohol affects the nervous system very readily is proved by its remarkable effects upon healthy persons. Can we then believe that in extreme cases of low disease, in which the nervous phenomena appear almost as in the healthy state, while the patient takes more than enough alcohol to intoxicate a healthy man, that the alcohol exerts no influence whatever? True, that in many cases, so little is the ordinary action of alcohol manifested, a patient may be taking an ounce of brandy every hour, and a bystander would not believe he was taking alcohol at all. Yet surely no one would maintain that therefore the alcohol is powerless and produces no more effect than so much water or any perfectly inert substance. That alcohol will produce delirium in health, and remove or prevent the occurrence of delirium in an exhausted state of the system, are facts, but they cannot be fully explained in the present imperfect state of our knowledge concerning the action of nerve-centres and nerves, especially the nerve-centres which control vascular phenomena.

Action of Alcohol upon Bioplasm outside Vessels in Pneumonia.—I propose now to consider what is actually going on in pneumonia, and shall endeavour to account in some measure for the beneficial action of alcohol in bad cases of this disease. The air-cells of the lung are filled with multitudes of living actively growing particles of bioplasm which have passed through the vascular wall with the serum, and are now absorbing nutrient pabulum at a very rapid rate; and probably, as these particles increase in number, an increased proportion of pabulum is diverted from all parts of the body to the "focus of inflammation," where they are multiplying. We *know* positively that a determination of common salt does actually take place to this spot; and it is, therefore, perfectly reasonable to infer that other matters are in the same way diverted from their usual destination, and absorbed here, instead of being used up in the ordinary change occurring in the normal state. (Med.-Chir. Trans. vol. xxxv., 1853.) I have already spoken of the pabulum which in a fluid state transudes through the stretched walls of the bloodvessels, and feeds the particles of bioplasm which in inflammation lie just outside them. Not only are the capillaries more readily permeated by reason of the stretching and consequent thinning of their walls, but the fluid in the bloodvessels possesses a greater tendency to permeate animal membrane; so that it would seem but reasonable to consider whether anything can be done to diminish this by altering the character of the fluid itself.

Let us now consider how alcohol acts upon the elementary parts of the living organism; and in order to render the arguments upon which my views are based intelligible, it will be as well to direct the reader's attention in this place to some points which may have been already referred to more than once in these lectures.

In the treatment of a sore upon the surface of the body, the means we adopt in order to promote the healing process check the free and rapid growth of the bioplasm. The commencement of the healing process is associated with more slow nutrient change. In the same manner what we desire to effect in the treatment of internal inflammations and the feverish state, is to check the undue growth of bioplasm which is proceeding in the blood in certain parts of the body, and in the "inflamed" tissues or organs. This bioplasm can only be reached through the blood. And it can be shown that the remedies which have been proved by experience to be of value in the treatment of such cases possess the property of checking the redundant growth of bioplasm, and can be taken up by the blood and distributed through the body without losing their properties. Now, in many extensive internal inflammations, such as pneumonia and pericarditis, it seems to me probable that the alcohol taken up by the blood really acts directly upon the morbid bioplasm growing and multiplying so very rapidly just outside the capillary vessels, and checks the process. It will be asked, upon the theory I have ventured to propound, How is it that the alcohol acts upon the morbid and not upon the healthy structure? But this question is not difficult to answer. The healthy cells, being surrounded by a thick, protective covering, or imbedded in a matrix, (cell-wall, intercellular substance,) are not affected by it; while the morbid cells, growing so fast that time is not allowed for the production of a hard external envelope, are fully exposed to the free action of soluble matters which transude from the blood. These, therefore, undergo the changes already described, and are caused to increase more slowly, while many are destroyed. In the growing cells in the air-cells of a hepatized lung, then, there is no evidence of *deficiency* of *vital* power; and the remedies which act favourably really seem to act not by *increasing vital power*, but by diminishing *the rate at which vital changes are proceeding*—in fact, by causing particles of bioplasm which were living *too fast* to live *more slowly*, and by causing *the death* of many of them.

Author's View supported by many General Facts.—This explanation of the action of alcohol is in harmony with many broad facts familiar to all. By it we may account for the shrivelling of the hepatic cells, the shrinking of the secreting structure, and the increased hardness and condensation of the entire liver, which result from the continued bathing of the gland-structure by blood almost constantly loaded with alcoholic poison. It explains the gradual shrinking and condensation of tissues which occur in persons who have long been accustomed to excess. The tendency to increased formation of adipose tissue which occurs in many of those who live generously, and seems to be augmented by alcohol, may be explained upon the same view, and the stunting in growth which follows its exhibition to young animals is also accounted for.

Action of Alcohol upon the production of Heat.—In a slight catarrh in a healthy man, six or eight ounces of alcohol did not lower the temperature, which however was only 100·7, (Parkes and Wollowicz.) This fact cannot be advanced as an argument against the value of alcohol in cases of fever and internal inflammation. In slight febrile disturbances there is no doubt whatever not only that alcohol in large quantities does no good, but that it does positive harm, by exciting the heart's action unduly and tending to produce narcotism. In very low states of system, however, albuminoid matters are fast escaping from the blood, the blood-corpuscles are undergoing rapid disintegration, *and the living matter or bioplasm* of the vessels of the neighbouring tissues and of the blood is growing very quickly. The changes referred to are associated with a rise in bodily temperature. Alcohol, as has been shown, tends to modify all these phenomena. And I believe that by further research in the same direction we shall succeed in giving a full and thoroughly satisfactory explanation of the action of alcohol in lowering the body heat in severe attacks of fever.

Summary.—The observations upon the action of alcohol on the "cells" or elementary units of the tissues justify us in concluding that its beneficial influence in very bad cases of disease is due in part to its action upon the pabulum and its tendency to render albuminous solutions less permeable, and partly to its direct action upon particles of naked and living bioplasm. Alcohol reduces the permeating tendency of the serum; it checks the disintegration of blood-corpuscles; it prevents the rapid growth of living matter; and it interferes with or modifies chemical changes taking place in organic fluids. When these changes are proceeding very rapidly, the capillary circulation beginning to fail, the heart's action becoming very weak and fluttering, and the strength ebbing fast, alcohol may save life.

In conclusion, the local and general action of alcohol may be shortly summed up as follows:

1. In internal wounds, and in internal diseases where alcohol acts beneficially, the good result is in part at least due to the alcohol checking the *increased action* already established.

2. Alcohol does not act as a food; it does not nourish tissues. It may diminish waste by altering the consistence and chemical properties of fluids and solids. It cuts short the life of rapidly growing bioplasm, or causes it to live more slowly; and thus tends to cause a diseased texture, in which vital changes are abnormally active, to return *to its normal and much less active condition.*

3. In "exhausting" diseases, alcohol seems to act partly by diminishing very rapidly the abnormally increased growth of bioplasm. The quantity required will depend upon the extent to which the changes alluded to have proceeded. In extreme cases half an ounce of brandy, or even more, may be given for a time (in some cases even for several days) every half-hour; and there is reason to believe that in desperate cases life is sometimes saved by this treatment.

Practical Conclusions.—Lastly, I shall venture to repeat here the conclusions I arrived at many years ago concerning the great value of the alcoholic treatment of low fevers and inflammations. Increased experience has afforded further confirmation of the correctness of the statements made in the paragraphs below. I do not, of course, refer to slight cases of fever, pneumonia, etc., in which no stimulant whatever may be required, but to *very severe cases of disease* only.

1. In what appeared hopeless cases, as much brandy as the patient could be made to swallow (an ounce and a half to two ounces in an hour) has been given for several hours in succession, and then as much as thirty ounces a day for several days, not only without producing the slightest intoxication, vomiting, or headache, but the treatment has been followed by recovery.

2. I would adduce the fact that a man not accustomed to drink, when suffering from acute rheumatism, complicated with pericarditis with effusion, pneumonia at the base of one lung, and pleurisy on the opposite side, has taken twenty-four ounces of brandy a day for eleven days; the tongue being moist and the mind calm during the whole time. While under this treatment, inflammatory products were absorbed, and the general state of the patient much improved.

3. I have been compelled to give a very weak child, weighing less than four stone, twelve ounces of brandy a day for ten days, while suffering from acute rheumatism with pericarditis and effusion. This quantity did not produce the slightest tendency to intoxication, or exert other than a favourable effect upon the disease. The patient did not begin to improve until the quantity of brandy, gradually increased, had reached the amount stated.

4. I would state that among the general conclusions I have arrived at, after carefully watching more than one hundred serious cases of acute disease treated with large quantities of stimulants, are the following:—That intoxication is not produced; that delirium, if it has occurred, ceases, or is prevented from occurring at all in the course of the case; that headache is not occasioned; that the action of the skin, kidneys, and bowels goes on freely; that the tongue remains moist, or, if dry and brown, often becomes moist; that the pulse falls in frequency and increases in power; that respiration is not impeded, but that, where even one entire lung is hepatized, the distress of breathing is not increased, and it appears that the respiratory changes go on under the disadvantageous circumstances present as well as if no alcohol had been given.

The conclusion from all this is, most certainly, that alcohol does not do harm in fevers and acute inflammations; that it does not produce intoxication in persons suffering from exhaustive diseases; and that large quantities (from twelve to thirty ounces) may be given in cases which appear very unlikely to recover, and sometimes the patient will be saved. The conviction is forced upon the observer that, in desperate cases, these large quantities of alcohol are directly instrumental in saving life, not by *exciting or stimulating to increased action, but by moderating actions already excessive*, and at the same time by causing the heart to contract more vigorously, and so continue to drive the blood through the impeded capillaries.—*Medical Times and Gazette, May* 25, *July* 13 *and* 27, 1872, *pp.* 591, 29, 88.

5.—ON THE TREATMENT OF HYPERPYREXIA BY THE EXTERNAL APPLICATION OF COLD.

In a very interesting and exhaustive paper upon this subject, Dr. **Straus** of Strasbourg goes over the entire history of the treatment of hyperpyrexia by the external application of cold, from the time of Hippocrates down to the present day, and the conclusions he arrives at are as follow:—If a healthy man be placed in a cold bath he speedily becomes chilled; his skin pale, *cutis anserina;* he shivers, and the thermometer in the axilla falls in proportion to the coldness of the water employed; but if the temperature of the interior of the body be taken in the anus, this is found to be normal, or only to fall a few tenths of a degree, and it only falls in any important degree when the experiment has been pushed to an extent which dare not be approached in therapeutics; but then the innervation of the heart and lungs becomes seriously implicated, and the bath cannot be prolonged without compromising life itself. A sound man, therefore, plunged into cold water, maintains the mean normal temperature of his blood notwithstanding the increased abstraction of heat from his surface, and he does so by an increased production of heat, which persists for a time, and is revealed when he is removed from the bath, dried, and clothed, by the production of that transitory febrile state termed the reaction, which is accompanied by a cutaneous temperature above the normal. Similar results occur in pathological conditions: a fever patient does not merely retain more heat than a healthy man, he produces it; instead of 37° C., his normal temperature is 39° C. or higher, and if he be plunged into a cold bath the results are similar. The cutaneous temperature is speedily brought down to that of the bath; the anal temperature falls only in a relatively insignificant amount, never more than one degree; and when removed from the bath the reaction occurs as in the physiological condition, so that at the end of two or three hours at the most, the initial temperature is attained or even surpassed. Even supposing, then, that this trifling and temporary lowering of the temperature, of a maximum of one degree, and lasting at the longest for two or three hours, should be considered desirable of attainment, it would be necessary to give the patient from ten to fifteen baths in the twenty-four hours, involving a most laborious practice for the attainment of a most trifling result.

There is one point, however, remarks Straus, upon which all the partisans of cold are agreed, and that is the sedative influence which the cold bath exercises upon the affections of the nervous system, and that this use of cold is most efficacious in delirium, cerebral affections, cephalalgia, singing in the ears, etc., and that it has thus a most favourable action in the malignant forms of fever, especially in the ataxic and adynamic forms. But, adds Straus, similar results have been obtained with much more certainty and energy by Currie's old method of cold affusion, which is more especially of the greatest value, and is specially indicated in an accident of extreme gravity which occasionally occurs in fevers—collapse.

It sometimes happens during the course of a fever that, when the thermometric ascension has reached its height, the temperature taken externally experiences a sudden fall from 40° or 41° to 34° or 32° C., while the anal temperature still maintains its former height. The skin is at the same time covered with a cold and clammy sweat, the heart contracts feebly, and the pulse becomes extremely feeble and thready. Such is the condition to which Wunderlich and his disciples have given the name of collapse.

The skin is chilled because the heart no longer has the force necessary to impel the circulation through it, the heart is paralyzed, and the lungs also, as seen in the short, superficial, often unequal and intermittent respirations, and revealed on auscultation by the gradually increasing engorgement of the lungs and the accumulation of the bronchial secretions, which the patient has no longer power to expel, exactly as happens after section of the pneumogastric nerves. And this collapse no doubt does arise from paralysis of these nerves, or rather of those nervous centres which preside over the functions of respiration and the production of heat, and it is these centres which it is so important to rouse by reflex excitement. The readiest method of doing this is the cold douche: a waterproof sheet is slipped under the patient, his shirt is removed, and he himself raised to the sitting posture, and a pitcherful of water, at a temperature at, or a little above 10° C., (50° F.,) is then poured over his head from a height of from one foot and a half to three feet. The result is marvellous, and is one often, nay, almost daily, observed in the clinique of Professor Hirtz. The patient, plunged in stupor, is suddenly roused by the shock; he draws a long breath; the respiration becomes fuller, freer, and more regular; the cardiac ataxy ceases, and the pulse becomes fuller and stronger; traced by the sphygmograph during the collapse, it presented a horizontal line, hardly broken by a few feeble undulations; during the affusion the line of ascension is reproduced and becomes well marked, showing increase of cardiac force, and also of arterial tension. The affusions should be repeated during two or three minutes; when finished, the patient is dried, laid down and covered up, the waterproof being removed. The thermometer, now applied in the axilla, shows that the external chilliness has disappeared, and that the temperature there is now normal or even higher, the anal temperature being considerably reduced. The temperature has, in fact, been redistributed, and the equilibrium between the external and internal temperature restored, the rupture of which is in a measure characteristic of the condition of collapse. The lungs, too, are now found to be acting freely, the râles are diminished, and the passing congestion is disappearing.

It is easy, however, adds Straus, to understand the physiological action of this treatment; cold employed in the form of affusion—that is, quickly and temporarily—acts not by subtracting heat, for the amount actually removed is perfectly insignificant, but by exciting, by its powerful and energetic reflex action, the nervous centres which preside over and regulate the circulation and production of heat. While acknowledging, therefore, the utility of Currie's cold affusions in febrile nervous affections, delirium, ataxy, and even in collapse, and also the advantage and propriety of cold sponging in refreshing the patient, and in cleaning and exciting the skin, Straus regards the use of the cold bath in the treatment of fever as a most expensive, troublesome, and possibly dangerous mode of producing very trifling results, and as far inferior to the use of such antipyretic remedies as quinine and digitalis, adding that a single draught of one gramme (15 grs.) of digitalis would lessen the fever more than a whole series of cold baths.—*Bull. Gén. de Thérap and Edin. Med. Journal, June*, 1872, *p.* 1137.

6.—THE COLD BATH IN THE TREATMENT OF ENTERIC AND TYPHUS FEVERS.

Cases under the care of Dr. ALEXANDER COLLIE, at the Homerton Fever Hospital.

We purpose giving a short account of some cases of typhus and enteric fevers treated at this hospital by the cold bath. That in some of the following cases the treatment was very useful is beyond a doubt, and in none is there any evidence that the disease was made worse by it, not even when severe lung affection co-existed. The patient in the second case seems to have been in *extremis*, and it would require very great faith in the *vis medicatrix naturæ* to believe that the patient recovered in spite of the treatment, for the beneficial effect of the bath was constant and well-marked. It is further interesting to note that in those cases which ultimately did well the immediate effects were beneficial, the temperature being lowered and sleep produced.

Case 1 was a young woman, aged twenty-eight, admitted on October 29th, suffering from a severe attack of enteric fever complicated with bronchitis.

She became convalescent on November 14th. On the 27th, however, diarrhœa came on, the respiration became hurried, and the tongue dry and fissured. On December 3rd the temperature in the rectum was 104·4° F.; pulse 132; numerous râles could be heard through both lungs; the abdomen was distended and the bowels loose, but there was no eruption. In this condition the patient was placed in a bath of a temperature of 80° F., which in fifteen minutes was lowered to 67°. In ten minutes after being put into the bath the thermometer in the rectum registered 100·4°. After being removed from the bath the patient immediately went to sleep. On December 4th the temperature in rectum was 105°, but fell considerably after a bath of 68°, lowered to 52° in fifteen minutes. On the 5th, 6th, and 7th, baths were given. On the 8th the temperature was normal, but on the 9th it had gone up to 100·2°, and the bath was repeated, when it fell again to 98·6°. On the 10th, thirteen days after the relapse, the patient was convalescent; temperature normal. She was discharged on January 30th.

Case 2 was a young woman, aged twenty-five, admitted Dec. 5th, with but slight pyrexia, but on the 10th well-marked typhus rash was present. Temperature 103·4°; pulse 160; tongue dry and brown; well-marked carphology, restlessness, and delirium. A cold bath was thought of as a means of producing sleep; but as the patient was in a state of extreme constitutional depression, it was feared that the bath might be followed by dangerous results. She was therefore ordered a pill containing half a grain of opium, and to have cold cloths applied to the head. The opium did not produce sleep, and from this time up to the 15th, probably the twelfth day of the disease, the patient exhibited subsultus, twitchings, floccitatio, deafness, and all the signs of threatening dissolution. Pulse 132, soft; temperature 100·6°. A bath was ordered of 80° to be cooled in twenty minutes to 60°. During the bath the patient's pulse became alarmingly feeble, and stimulants were administered. In about twenty minutes after being put into the bath the temperature of the patient fell to 97·8°. After the bath three ounces of whiskey and a raw egg were given, and the patien was wrapped up in a warm blanket, and soon fell asleep. By midnight the temperature had gone up to 101·4°. On the 16th (thirteenth day of disease) the temperature was 103·4°; a bath was ordered from 77° to 54°, but this time the temperature fell only one degree, but sleep followed the bath. On the 17th the temperature was 104·8°, and, notwithstanding the presence of severe bronchitis, a bath from 90° to 60° was ordered, and the temperature fell to 96·2°, and the patient slept well. On the 18th the patient was better, the nervous twitchings were less, and the bath was not repeated. On the 20th the temperature was normal. On Jan. 29th patient was discharged.

Case 3 was a married woman, aged twenty-eight, admitted Dec. 12th, who said that she had been ill ten weeks, but of what was not clear. A bath of 90° lowered to 52° in thirty minutes had the effect of bringing down the temperature from 103·2° to 100°. No immediate sleep followed the bath, but the patient slept well during the night. On the 14th the bath was repeated, and the temperature lowered, and the patient slept immediately after; and although by midnight the temperature had risen to 105°, the patient had a good night. On the morning of the 15th the temperature was 104·2°, but was lowered to 102·2° by a bath, but by midnight it had risen again to 105·4°. On the 16th the bath was not repeated, as the patient was sweating freely. On the evening of the 17th the temperature was 104·4°, but fell to 102·6° after a bath. In the evening of the 18th the temperature was 103°, but the bath was not repeated. In the morning of the 19th it was 102.° From this time to the 28th the temperature ranged about 100°, when it became normal, the patient being discharged on the 31st of January.

Case 4 was a boy, aged seventeen, admitted on Dec. 17th with enteric fever. On the 22nd, after a bath of 85° to 58°, the temperature fell from 105·2° to 102·8°, but no other good result followed. On the 23rd the temperature had risen to its former height, but as the patient objected to the bath it was not insisted on. On the 24th, however, the urgency of the symptoms suggested the bath, which was accordingly given, with the effect of lowering the temperature from 104·8° to 101·8°. The patient died sixteen hours after this bath, and at the autopsy extensive peritonitis and perforation of the bowel were discovered.—*Lancet, September* 21, 1872, *p.* 410.

7.--THE TREATMENT OF SMALL-POX BY VACCINATION.

By Dr. WILLIAM MARSHALL, Mortlake, Surrey.

[Vaccination is not only preventive but actually curative in small-pox. Dr. Marshall and Mr. Furley have evidently come to somewhat the same conclusions unknown to one another. Mr. Furley has, however, gone further than Dr. Marshall in injecting lymph into the system. Dr. Marshall's conclusions as to the effect of vaccination in arresting small-pox are, however, more fully elaborated, being the result of experiments and observations extending over a period of five or six years.]

In estimating the value of vaccination as a cure for small-pox, it is necessary to be acquainted with the course of that disease in all its varieties, and to bear in mind that its incubative stage is thirteen days; and that vaccination, as far as my observation goes, is a local disease until some time between the eighth and eleventh days; it is only then that the constitution becomes affected, and it is so from absorption of the lymph in the matured vesicles. I come to this conclusion from observing that a person exposed to the infection of small-pox within eight days after being vaccinated may take the disease; but no matter how much exposed after the eleventh day, he will not take it. Also if a person who has been vaccinated be revaccinated within seven or eight days, the revaccination will take in some modified way; but if done after the eleventh day not at all. Hence, if an unvaccinated person who has been exposed to the infection of small-pox be vaccinated in time for the vesicles to rise, and the lymph to be absorbed before the symptoms of small-pox begin, he will either have no attack, or, what I think is more common, will have severe symptoms, ending with the appearance of a few spots, sometimes of none. But if the symptoms of small-pox commence before the vesicles have risen and begun to desiccate, he will have a severe attack, but modified in so far that there will be no secondary fever.

I shall not occupy space further than in giving the following history.

In a large family an unvaccinated child had small-pox and died. I only saw it when dying. I recommended all the others to be vaccinated. Four had been previously vaccinated; these were revaccinated; none of them took the disease. Three of the sons had never been vaccinated; one of them I vaccinated directly and satisfactorily, but just as the vesicles were desiccating, he showed symptoms of small-pox, and five spots appeared on his face, and a few on his body; he was not confined to bed a single day. The second on the very day he was vaccinated became ill with small-pox, and the third, who had never been vaccinated, was taken ill on the same day. Both of these had the disease severely, but the contrast between the two lying in the same room was most remarkable. In the second son the vaccination and the small-pox progressed, the one entirely unaffected by the other until the tenth day; the vaccine vesicles then desiccated and so did the small-pox ones, and the disease came to an end; he had *no secondary fever*, and was sitting up *quite well*, while his brother—the unvaccinated one—was lying in a high secondary fever, delirious, and battling for his life. These cases occurred six years ago, and this was the first instance I had seen of the curative effects of vaccine. Since then, however, I have seen many, and have always observed the same result, so that I think that I can have made no mistake; I was therefore much surprised a few weeks since to see in the summary of the trial of some of the "Peculiar People" for the manslaughter of two children, who had died of small-pox without medical aid, &c., that a third, who had been vaccinated, had small-pox directly after and died of it. I should be very much pleased if the doctor who attended the case would publish details of it, especially with regard to the date of the onset of the symptoms of small-pox after the vaccination, the date of the death, and the cause of it.

The great objection to the use of vaccination in the cure of small-pox is the necessity, in my experience, of its being done within a day or two of the onset of the disease, otherwise the vesicles have not time to rise and affect the system in a curative manner; but Mr. Furley's plan of injecting a large quantity of lymph under the skin seems to be exactly what is necessary, and may be done with hopes of immediate benefit at any stage of the disease.—*Lancet*, *June* 15, 1872, p. 825.

8.—THE TREATMENT OF SMALL-POX BY VACCINATION AND THE INJECTION OF LYMPH.

By R. C. Furley, Esq., Edinburgh.

The doctrine universally held, that vaccination will be of "no use" if delayed till five days after the inhalation of the germ of variola, I think, is erroneous. For some time past I have been in the habit of vaccinating every case of small-pox that has come under my care; and the result, as I shall show, is very encouraging, and seems to indicate that vaccination is not only prophylactic but *curative.* I have found, however, that, although the ordinary process of vaccination by scratching the arm is sufficient to modify the disease in infants, it is almost inoperative in adults. After having discovered that the ordinary process was almost useless in grown-up persons, I adopted the method of injecting lymph by means of Dr. Wood's hypodermic syringe. This instrument I also found occasionally to fail, because, on passing the wire through the needle after the operation to keep it clear, I have found it to eject the lymph which I had hoped had been in the blood. This, I am afraid, has been the cause of two otherwise unaccountable failures out of sixty cases. How to obviate this source of fallacy occupied my thoughts for a considerable time. At last, however, I succeeded in inventing an instrument that promises to transfer lymph directly from the tube in which it is contained into the circulation. It consists of a hollow needle with a bore sufficiently large to admit of the introduction of a vaccine tube. The process consists in passing the point of the needle charged with a tube of lymph under the skin, and blowing the lymph directly into the blood. I have purposely described this minutely, in order that, if any of my brethren do me the honour of verifying the results of my treatment, they may not commit the errors which experience has pointed out. It would occupy too much space to describe many cases; I shall therefore only give three to illustrate the effect of the treatment at the different periods of life—infancy, childhood, and manhood.

Case 1.—Baby C., aged one month, and unvaccinated. When first seen, the papular eruption was over the face, hands, and legs. There had been three cases of small-pox in the house. One had been sent to the Small-pox Hospital, where the mother had visited him. I ascertained that this was really the case from the resident physician, Dr. Saxby. I vaccinated the child at once. Next day, when I called, the eruption had entirely disappeared, with the exception of two papules on the face, which were now more prominent. On the third day these two papules disappeared, and a fresh crop of four-and-twenty, chiefly over the head, made its appearance; and these became hard, and did not fill like ordinary vesicles. In three days these had also disappeared. The vaccination itself did not show any signs of taking till the tenth day, and was matured on the thirteenth.

Case 2.—M. R., aged thirteen years, vaccinated in infancy, and whose sister had died of small-pox a week before. I was called in on a Saturday, and found her face considerably swollen, and the papular eruption on the hands and forearms. I at once *injected* two tubes of lymph into the arm. On Sunday the eruption had disappeared from the hands and arms, and appeared on the feet. On Monday it had spread up the legs and trunk. On Tuesday it had entirely gone away, and there was nothing to be seen but the inflamed areola at the point where I had injected.

Case 3.—J. W., aged thirty-four, a stableman of dissipated habits, and never vaccinated. I saw him on the second day of the eruption, and injected two tubes of lymph. The case, instead of being confluent, as might have been expected, was discrete, except at the alæ of the nose. He went on very favourably, and the eruption began to desiccate on the ninth day instead of the fifteenth, eighteenth, or twentieth. There was no areola at the point of injection.

I think these cases, selected from a number of such, show that there is at least a germ of truth in my statement that vaccination is curative of small-pox. I find that the treatment is much more successful in the youthful than in the adult period of life; and I am beginning to think that this arises from adults requiring, as it were, more of the remedy. It is also more effectual the earlier the operation is performed. I have usually found that the vesicles did not attain the size they do when the disease is allowed to run its course; they did not often become pustular, and desiccated earlier.

No doubt I have had failures and deaths; the latter five in sixty cases, in three of which I did not look for recovery from the first on account of other complications, and two were unlooked for: all were females—a fact of itself of some significance. I reserve for a future communication a detailed summary of all my cases; meantime I trust I have said sufficient to encourage my brethren calmly to investigate the subject.

I should have mentioned that the instrument I employ for transferring the lymph directly into the blood was made for me by Mr. Young, cutler, Northbridge.—*Lancet, May* 25, 1872, *p.* 717.

9.—CASES OF SMALL-POX TREATED BY THE HYPODERMIC INJECTION OF VACCINE LYMPH.

By Dr. Robert Grieve, Medical Superintendent, Metropolitan Hospital, Hampstead.

In the Lancet of the 25th May, Mr. Furley, of Edinburgh, brings under the notice of the profession the alleged curative action of vaccine lymph in small-pox. My attention had been previously directed to letters sent by him to a daily newspaper in Edinburgh, in which ordinary vaccination was lauded as a specific and certain remedy for variola. Hoping fervently that Mr. Furley was in the right, and that it would be proved that my ideas about the want of any influence of cow-pox over small-pox when concurrent, unless induced before the sixth day of the period of incubation of the latter, although derived from the observation of a considerable number of cases, would turn out to be erroneous, this plan of treatment was tried on six of our patients. Three of the six died, and in the others the disease followed its usual course, uninfluenced to any noticeable extent by the vaccination. These were not very successful results, but, as with one exception the subjects upon whom the treatment was tried were adults, they agree with Mr. Furley's, for he now says that "it (vaccination) is almost inoperative in adults." Believing, apparently, that the vaccine poison is a true antidote to the variolous, and the quantity required to be introduced into the system to neutralise the disease is larger than that used in the ordinary operation of vaccination, he now recommends the hypodermic injection of the lymph. Upon this theory nothing need be said, although it seems to me that it is by their great similarity, if not virtual identity, that the vaccine acts upon the variolous disease, and that if Mr. Furley is right in his deductions, in this instance at least the dogma of homœopaths is correct, *similia similibus curantur.* But putting theory on one side in order to give the practice a full and fair test, seven patients were operated upon after Mr. Furley's method. In this communication I propose giving the details of the cases so treated as entered in the hospital case books by Mr. Bland, assistant medical officer, appending only such remarks as may be necessary to convey the impressions received while watching the daily progress of the patients.

One point which Mr. Furley's paper brings out forcibly, and it is of very general application and interest, is this: that the deductions either from statistics of mortality or from the results of any particular line of treatment in small-pox are sure to be fallacious unless the age and particular state as to primary vaccination of every patient under notice be considered. In Mr. Furley's instance, he had had by his own statement five deaths in sixty cases. It entirely depends on the conditions mentioned above whether this is to be considered a low rate of mortality or not. If all his patients were unvaccinated it is assuredly a very low one; but if they were all between the fifth and twentieth years of age, and had four or more good marks of primary vaccination, then it is a high rate, especially for private practice. These suppositions are both extreme, but in the absence of the particulars required for making a correct estimate, any opinion formed as to the success or non-success of Mr. Furley's treatment is pure conjecture. Another difficulty in forming a correct judgment as to effects of remedies in small-pox in the *vaccinated* subject is the impossibility of telling at the earlier periods of the attack, say up to the sixth day, what will be the exact course of the disease even if left to itself. I have often seen patients who on the fourth and fifth days of the disease had a temperature of over 104°, whose faces were swollen, and of a general bright-crimson hue, and who were delirious at night, and on the eighth and ninth day they felt well, their temperature was normal, and a few hard scales was all that remained of the eruption that promised to be so severe; and this without treatment of any kind. In the *unvaccinated* class it is different: the disease may not always take the confluent form, nay, sometimes it is quite discrete, but it is very rarely indeed that the rash aborts; however sparse it may be it reaches the pustular stage, and the pustules are full-sized and umbilicated. In my experience, in all vaccinated cases the disease is modified, even when it proves fatal, and the proportion of instances is very large indeed in which it runs a highly modified and more or less abortive course. In the Hampstead Hospital the mortality in this epidemic in the vaccinated of all classes has been 11·40 per cent.; it is found that in about 12 per cent. the disease is severe, either confluent or semi-confluent, leaving over 75 per cent. for very mild and aborting cases. One can therefore imagine it possible for a practitioner to have in succession fifty or sixty mild cases, especially in a community said to be so well protected by vaccination as that of Edinburgh is.

The method followed in injecting the lymph was strictly as described by Mr Furley, though a grooved needle widened at one extremity (made for me by Messrs. Arnold and Son). The contents of two tubes of vaccine lymph were blown into the subcutaneous tissue on the outer side of the arm, near the usual place of vaccination. The lymph used was taken from a primary vaccination in a healthy child on the eighth day of the pock, and was only five days old.

Case 1.—J. S., male, aged twenty-five, clockmaker, admitted June 2nd. Two vaccination marks. Five days ill. Rash vesicular, small, and very copious; semi-confluent on face; the areola well defined.

June 3rd. Temperature 102·8°; pulse 120. Eyes suffused; coughs a little; bowels open; takes food fairly; had a quiet night; tongue furred, red at tip. Large crepitation distinct over both lungs posteriorly. Expectoration frothy and very profuse. Respiration 24. Vaccine lymph injected (in presence of representative of the Lancet).—9 p.m.: Temperature 101·4°; pulse 104; rash the same as this morning, but fuller.

4th. Eruption on face vesicular, small in size, very copious, and semi-confluent; on trunk and limbs also vesicular, small in size, but less copious and discrete. Lips swollen; eyes watery; tongue slightly furred and moist; cough less, and expectoration slight. Muttering delirium all night; no sleep. Bowels confined. Swelling and tenderness at seat of injection. Pulse 104; temperature 101·6°; respiration 30. 9 p.m.: Temperature 100·4°.

5th. Eruption maturated, and in some places exudation taking place from pustules on face; on trunk and limbs, still vesicular. Swelling of upper lip increased; some general swelling of face; lachrymation; great tenderness of skin; tongue dry and glazed. Wandering delirium during the night; very little sleep. Eyes suffused, and conjunctivæ injected. Redness and tenderness at seat of inoculation. Respiration loud and cooing, 30. Expectoration less. Pulse 112; temperature 101·8°. 9 p.m.: Temperature 100·6°.

6th. Eruption beginning to dry on face, pustular on limbs and trunk; swelling of face slightly less. Slept well; no delirium. Tongue dry; eyes suffused, and conjunctivæ much injected; bowels open. Takes food well. Still slight swelling, tenderness, and redness at seat of inoculation. Temperature 103·2°; pulse 130; respiration 24. 9 p.m.: Temperature 103·4°.

7th. Eruption on face crusting round the mouth and nose, fully pustular on other parts; face still swollen. Has had a very restless night; no delirium. Lies in a semi-stupor, with his head thrown back. Tongue very red and dry. Respiration 30, and rather laboured; pulse 130, feeble; some tremulousness of hands; temperature 104·6°. The whole arm at seat of injection is swollen, hard, red, and painful. 9 p.m.: Temperature 104°.

8th. Eruption on face drying; on hands the rash is becoming horny, with a few pustules here and there. The whole of the right arm is swollen, tender, inflamed, and becoming brawny to the touch. Tongue dry and brown. Had a rather severe rigor last night, lasting a quarter of an hour; quiet night, slept well. Bowels confined. Pulse 120; temperature 103°; respiration 32. No cough or expectoration. 9 p.m.: Temperature 103·2°.

9th. Face covered with irregular crusts; on limbs and trunk nearly dry. Slept well; no delirium. Tongue dry and glazed; bowels open; very tremulous; no swelling of face; fluctuation becoming distinct over the whole of the anterior surface of right arm, more particularly at the seat of operation; forearm œdematous. Pulse 112; temperature 101°; respiration 32, laboured. The arm was incised, when about two ounces of thin pus escaped. A probe passed into the wound went in a direction downwards and outwards for about four inches. To have sulphate of quinine mixture, half an ounce, every three hours. 9 p.m.: Temperature 103°.

10th. Eruption quite dry on face, and crusted on trunk and limbs; drying fast. The wound has discharged very freely since yesterday, quite half a pint of thin pus escaping; swelling and inflammation somewhat less. Was very delirious all last night; purged three times. Tongue dry and tremulous, and he is unable to protrude it; countenance pinched and drawn. Takes milk and beef-tea well. There is general muscular tremor. Pulse 120; temperature 101°; respiration 32, stertorous. 9 p.m.: Temperature 102°.

11th. Arm discharging very copiously pus thin and unhealthy, otherwise the arm the same as yesterday. The patient lies on his back without moving, with mouth open, and breathing loud and deep. He is losing flesh rapidly; diarrhœa set in last night, but is now stopped; had a draught of catechu and opium. Tongue dry, brown, and tremulous. Was rambling and talking all night; no sleep. Bowels acted once to-day. Takes food well; prostration very great; sweats a great deal. Pulse 112, very compressible; respiration 34; temperature 102·6°. Both lungs posteriorly have a want of resonance; respiratory murmur very feeble; anteriorly resonance good, but murmur feeble, although less so than posteriorly. 9 p.m.: Temperature 104·6°.

12th. Pulse 140, tremulous; respiration 40; temperature 104°. Incision has sloughed to the size of a half-crown; the cellular tissue quite dissected out from between the muscles. Diarrhœa began again last night, and still continues (about six times in twelve hours); motions very loose, and passed under him. Delirious rambling and talking all night. Tongue very dry, brown, and tremulous; has a general tremor; weakness very much increased; sweats very much; skin quite moist and clammy. Takes food very freely. Died at 5.40 p.m., after convulsions.

Permission for a post-mortem examination was refused. This was a severe case of small-pox, complicated in the first place with bronchitis, and afterwards by consequences which were clearly traceable to the injection of the lymph. It was found, on inquiry into his previous history from his friends, that he had not enjoyed good health for some time, and had suffered from some chest affection.

Case 2.—E. L., female, aged twenty-two, domestic servant, admitted on the 3rd of June, on the fourth day of her illness, with a papular rash, small in size, moderately copious in quantity, and discrete on the face; on trunk and limbs the eruption is sparse; temperature 99·8°. In the afternoon the lymph was injected in the usual manner (also in the presence of the representative of the Lancet). 9 p.m.: Has had a comfortable day; tongue furred; eyes suffused; takes food freely; pulse 88; temperature 101·4°.

June 4th. Eruption small and becoming vesicular; no swelling; had a quiet night, but without sleeping; slight soreness of throat; temperature 99·4°; pulse 88. 9 p.m.: Temperature 103°.

5th. Eruption maturating irregularly on face, where there are a few pustules, with a large number of vesicles and papules hard to the touch; on the trunk and limbs eruption small and aborting. Slept well; no swelling or uneasiness, except at the seat of the injection, where there is slight enlargement and tenderness; pulse 104; temperature 100°. 9 p.m.: Temperature 101·2°.

6th. Pustules drying in places; pulse 96; temperature 99·8°. 9 p.m.: Temperature 100°.

7th. Eruption generally drying and hardening; sleeps well; tongue clean and moist; the pain and swelling at the place of injection has quite gone; pulse 90; temperature 99·4°. 9 p.m.: Temperature 99°.

8th. Pulse 84; temperature 98·6°. 9 p.m.: Temperature 98·5°.

9th. Eruption quite dry; small crusts left, which are beginning to fall off; pulse 96; temperature 98·5°. 9 p.m.: Temperature 98·5°.

10th. Face almost clear; feels quite well; pulse 72; temperature 98·6°: 9 p.m.: Temperature 98·6°.

11th. (Twelfth day of illness.) Pulse 96; temperature 100·4°. 9 p.m.: Temperature 100°.

12th. Temperature 98·5°. 9 p.m.: Temperature 98·5°.

This case was a mild one from first to last, as shown by her condition when admitted. The impression of those watching her was, that the patient did not progress so rapidly as might have been expected from the general symptoms. The disease did not completely abort, or we should not have had the rise in temperature on the twelfth day, for which no accidental cause could be discovered.

Case 3.—M. A. P., female, aged twenty-three, domestic servant, was admitted on the 5th of June. Had three good vaccination marks. She states that after premonitory symptoms, which she describes as severe, a rash appeared yesterday. On admission the face was thickly covered with a rash of a dusky-red colour, and slightly elevated above the surface. An eruption of the same character, but more sparse, exists on the trunk and limbs. Eyes suffused; lips swollen, and the cuticle separating. 9 p.m.: Temperature 104·2°.

6th. The eruption much the same as yesterday; lips and eyelids much swollen. Did not sleep in the night; was not delirious. Early this morning hemorrhage from the vagina set in; has slightly the characteristic hemorrhagic fetor; bowels open; tongue much coated. Pulse 140; respiration 28; temperature 104·2°. Vaccine lymph injected. 9 p.m.: Pulse 140; temperature 104°; vaginal hemorrhage much more severe. To have ten minims of solution of morphia with fifteen minims of dilute sulphuric acid in water, every three hours; ice and iced drinks *ad libitum*.

7th. Eruption on face becoming irregularly vesicular, and seems confluent; on trunk and limbs also partially vesicular, but discrete. Swelling of the face more marked; eyes suffused; lips black; fetor stronger. Vaginal hemorrhage increased. Did not sleep and was delirious in the night; is now rational. Tongue covered with a thick brown fur. Pulse 120, small; temperature 102·8°. A patch of ecchymosis, about the size of a florin, exists at the place where the lymph was injected. She coughs slightly, and expectorates mucus streaked with blood. 9 p.m. Temperature 103·4°.

8th. Eruption on the face of a dingy-white colour, interspersed with livid patches; on the trunk and limbs many of the vesicles are filled with a black fluid. Lips and lower part of face much swollen. Did not sleep last night, but was not delirious. Vaginal hemorrhage still severe. Tongue covered with a thick brown fur, and dry in the middle. Cough becoming troublesome, and expectoration of the same character as yesterday. She now complains of pain and a feeling of oppression across the upper part of the chest. There is dulness on percussion posteriorly on both sides, more marked on the right; loud râles are audible in the same parts. Pulse 140, very feeble; temperature 103°; respiration 28, laboured. 9 p.m.: Temperature 103·6°. Died at 11 p.m.; was conscious to the last.

Could not obtain leave to make a post-mortem examination. This was a case of malignant small-pox, in which the hemorrhagic symptoms, although rather late of being developed, ran a short and severe course, uncontrolled by the injection of the lymph. Death occurred on the eighth day of the disease, evidently hastened by the most common complication of variola nigra—if it can be called a complication—congestion of the lungs. It was ascertained that this patient had led a rather irregular life.—*Lancet*, *June* 29, 1872, *p.* 889.

10.—A NEW THEORY OF GOUT.

By Dr. Austin Meldon, Surgeon to Jervis Street Hospital, Dublin.

A glance at the history of gout will convince the most incredulous that little progress has been made in the pathology of the disease. There is, moreover, some reason to believe that in its treatment we are not much in advance of the ancients. The humoral theory of Hippocrates and Galen does not differ essentially from the uric-acid and urate-of-soda doctrine of the present day; and there is much uncertainty as to whether our forefathers did not know of the existence of colchicum or some kindred plant. Be this as it may, one thing is certain—gout is now a more common and a more fatal disease than heretofore. Within the last twenty years, at least six thousand persons have died in the United Kingdom directly from this disease, and ten times that number have perished indirectly from it. I therefore deem no apology necessary for laying my views of the nature and treatment of this important affection before my professional brethren, believing it to be the duty of every medical man to forward as far as he can the pathology of disease.

Cullen, who believed gout to be an affection of the nervous system, had few followers; it was difficult to explain by this theory many of its phenomena, and it soon, therefore, passed into oblivion. It was replaced by the reappearance of the humoral theory, which lasted until Dr. Garrod's experiments proved the existence of uric acid in the blood of the gouty. The late Dr. Gairdner believed that the disease was due to venous congestion, but with the exception of a few of his followers, here and in Germany, most medical men have adopted the uric-acid theory.

True, many do not believe, with Dr. Garrod, that the kidney is the organ whose functional impairment causes this undue accumulation of uric acid, but refer it to derangement of the stomach, liver, or kidneys; the principle of the doctrine is, however, universally received. I have, nevertheless, little doubt that every practical physician will agree with me, that the presence of uric acid or urate of soda cannot be the sole cause of this distressing malady. In Ireland, gout is one of the rarest affections met with in hospital practice, yet I have repeatedly found the blood of otherwise healthy men lying in our accident-ward loaded with urates; and my own blood has been in this condition for years, although I have never had the least symptom of gout. Dr. Gairdner found urates in the blood of a boy four years of age, in whose family gout had never been known. It is therefore necessary to find another link to complete the chain; this, I think, is furnished by Cullen's theory.

The predisposing cause of gout is undoubtedly the presence in the blood of uric acid, and of soda in some form; nerve force, I believe, when in a healthy condition preserves these two in a fluid state, separately, in a condition in which they may be eliminated by the skin, kidneys, or bowels. As soon, however, as this nerve influence is lessened, these two substances unite in the tissues most removed from the brain and centre of circulation. Irritation and inflammation excite the nervous system to increased energy, and the disease for the time is arrested; often, however, a like cause produces a second exacerbation, a third, or even a fourth, and then nature gradually alters or removes that which has been deposited, and all traces of the fit have passed away. The time that an attack generally commences is at night, when both nerve-force and the circulation are weakest; the position, moreover, most usually affected—the great toe—favours my theory; and I need scarcely mention the numerous instances recorded where a fit of gout has been brought on by great nervous depression. Columbus never suffered from the disease until disappointment and ingratitude depressed his whole nervous system. Hundreds of similar cases are familiar to all; politicians and speculators are particularly liable to gout.

The action of colchicum furnishes me with one more proof. By an experiment which may be repeated by any one at will, I have satisfied myself that it is a nervous stimulant. Repeatedly have I, whilst fasting and in perfect health, taken doses of from ten to fifteen minims of tincture of the seeds of colchicum. Its effect was to produce, first nausea, and then increased action of all the organs of the body; the skin became moist, the action of the kidneys and liver increased, and the mental faculties were invigorated. On some occasions the heart's action was much increased, and I have even experienced severe palpitation consequent on its use. All these results can only be produced by a nervous stimulant. This is the only way too, in which its apparently magical influence on a seizure of gout can be explained, and it accounts also for the injury which its too frequent use may produce.

In conclusion, I have to recommend for trial, in the treatment of chronic gout, some medicines from which I have, in my practice, derived the greatest assistance.

Sulphate of nickel and the triple phosphate of iron, quinine, and strychnia will be found of the greatest benefit.

There is but one other point connected with this subject which I desire to mention. It has often been doubted that the skin can eliminate uric acid; but if a large quantity of perspiration be collected, and after evaporation, tested, abundant crystals will be obtained. For this experiment it is necessary, in the first instance, to have a large quantity; I have repeatedly obtained as much as a pint, by aid of the Turkish bath. From a small amount of perspiration I rarely succeed in obtaining positive proofs of its existence.—*Lancet, July* 27, 1872, *p.* 114.

11.—ON THE TREATMENT OF RHEUMATIC GOUT BY THE AID OF THE CONSTANT GALVANIC CURRENT.

By Dr. Julius Althaus, Physician to the Infirmary for Epilepsy and Paralysis.

[The author in this paper does not enter into the question as to the real nature of the disease. He remarks, in the introductory portion of the paper, that rheumatic gout is one of the few diseases which can be diagnosed by merely looking at the patient, without asking a single question.]

I will not here discuss the question whether rheumatic gout owes its origin to a special poison which is generated in the system. No proofs have been brought forward for the assertion that it is so, which has perhaps been somewhat too rashly and confidently made; pathologists relying for this view more upon the analogy of the disorder, with gout on the one, and rheumatism on the other, hand, than upon any very precise data at their disposal with regard to rheumatic gout itself. Taking all the special features of this distemper into consideration, it seems to me more rational to look upon it as a nutritive disturbance of the joints peculiar to old age, or premature old age. By far the largest number of cases of this disease are observed after the age of 45; and although instances do occur in which rheumatic gout occurs in much younger persons, yet we invariably find, when such is the case, that emotions, anxiety, privations, voluntary or involuntary offences against the laws of hygiene, and other debilitating influences, have produced a sort of premature *senile decay* in the persons thus affected The morbid process which under these circumstances takes place in the joints, is indeed very analogous to the atheromatous process which occurs in the internal tunic of the arteries at the same period of life, and which nobody thinks of putting down to a special poison generated in the system. It constitutes one of those highly *insidious and chronic inflammatory conditions which are characteristic of the period of involution and senile decay.*

This peculiar kind of inflammation, which, if it occur in the synovial membrane and the articular cartilages, we call rheumatic gout, or rheumatoid arthritis, or arthritis deformans, and which, if observed in the intima tunic of the arteries, we call endo-arteritis deformans, or the atheromatous process, never seems to lead to suppuration, as it is not intense enough for that. The first thing that occurs in the joints is hyperplastic proliferation of all the parts involving the same. The synovial membrane throws out, partly, somewhat large pediculated polypi, consisting of fat and connective tissue, and partly a finer kind of tufts and fringes, causing a peculiar roughness of the surface, which Volckmann has appropriately likened to a sheep's-skin. The cartilages likewise become proliferated, at first in their superficial and external layers, and subsequently in their deeper parts. In the healthy cartilage, *pairs of cells*, which look like the two halves of a ball cut through in its middle, are seen to be regularly imbedded in the hyaline basement substance; and the proliferation of these cells occurs in strict proportion to a simultaneous growth of that basement substance, so that always a proper distance is kept between the several cells. Now, recent microscopical researches have shown that in rheumatic gout, on the contrary, *groups of from ten to twenty large cartilaginous cells* are formed, which are lying close to one another, to the detriment of the basement substance, which becomes more fluid, absorbed, and finally altogether wasted. The natural consequence of this tissue-change is, that the joints are no longer able to stand the wear and tear, either of motion or of pressure, which is put upon them. The structure, therefore, gradually perishes, and proliferation continues only at the edges of the articular cartilages. There is, however, no uniform swelling there, but numberless small nodes are formed, which are as many ecchondroses, and which gradually coalesce to form a sort of wreath round the joint. The surface of the bone thus becomes gradually denuded. This, however, does not cause caries, but ostitis, terminating in sclerosis; and the bone becomes covered with a smooth, shining, white, and firm osseous plate, on which traces of the mechanical injuries to which it has been exposed during life may often be discovered. This brittle osseous tissue cannot, in the nature of things, resist in the long run the constant friction and grinding to which it is exposed, however quiet the patients may keep, in order to avoid the pain which is caused by every motion. If two pieces of pumice-stone were constantly rubbed against one another, only little would be left after a time; and in a similar manner the surface of the bone gradually wastes away. Whole epiphyses may thus perish; the neck of the femur will disappear; and the affected joints will altogether be so deformed that only little, if anything, is left of the original structure.

Looking, then, upon rheumatic gout as a disease of malnutrition peculiar to the period of involution and senile decay, we must not be led away by the term "inflammation" into antiphlogistic measures, which only make matters worse; but the great aim of our treatment should be to support and stimulate the failing powers. The remedies upon which chief reliance is placed by the best observers are, therefore, bark, mineral acids, strychnia, iron, cod-liver oil, and arsenic. There can be no doubt, from the positive statements of reliable practitioners, that in a considerable proportion of cases these remedies do a great deal of good; yet how frequently do we see patients who have for months and years been under the care of the most eminent physicians, familiar with all the ordinary resources of the art; who have had everything done for them which money can procure; who have not only taken gallons of physic, but paid one visit after another to Buxton, Bath, Wiesbaden, and Wildbad, and who yet find the distressing symptoms of their complaint gradually becoming intensified, the pain more severe, the deformity greater, the helplessness more embarrassing. Surely under such circumstances we cannot look with any degree of satisfaction upon our present treatment of rheumatic gout; and any means which promises, from general considerations, to be really effective in such cases, should have a fair trial given to it.

Holding these views, I have for the last six years sought and found many opportunities to use in this distressing distemper that most active stimulant of nutrition the continuous galvanic current; and, although I am far from considering it a specific or a panacea for all cases of rheumatic gout, yet I have seen enough of its effects to convince me that in cases where the most approved lines of medicinal and hydrotherapeutic treatment, intelligently and perseveringly followed, have, after months and years of trial, left the patient no better but rather worse than before, the constant current, judiciously administered, may do great good in a variety of ways. I do not mean to say that we can by its aid really cure rheumatic gout. The current cannot reproduce wasted cartilages, nor restore its normal structure to a sclerosed bone; it cannot prevent the patient from advancing in age, nor arrest altogether the process of involution and senile decay to which the system must in the end succumb; yet it can do much good. Instead of relating cases which might prove monotonous, I will shortly summarise the results of my experience about the therapeutical capabilities of the current in the disease now under consideration.

1. It acts as a general tonic to the system, and more especially to the nervous system. Although in some cases of rheumatic gout the appetite is tolerably good, the food taken is pretty well digested, and the action of the liver, the alvine evacuations, and the urinary secretions, are not very materially interfered with; yet we find that the large majority of patients suffer from some form of dyspepsia, and impaired action of the liver, bowels, and kidneys. In the cases to which I now allude, there is no actual disease of these organs, which sometimes becomes developed towards the end; but there is functional debility, owing to an insufficient supply of nervous force to the parts mentioned. Thus an insufficient quantity of food is taken; that which is taken is imperfectly digested; the elimination of effete matters from the system is slackened; and the consequence of all this is a degree of debility which is more alarming to the experienced observer than the discomfort and pain attending the local manifestations of the disease in the joints. Patients of this class have often considerable difficulty in taking medicinal tonics, which are apt to heat the system, while alteratives often lower it still more. Under such circumstances the constant current is often remarkably effective in rousing nervous energy and improving all the most important functions of the body. The best mode of application for this purpose is to direct the positive pole, armed with a conductor of large surface, to the cervical spine, while the negative pole, similarly armed, is placed on the pit of the stomach. A gentle current, which even patients of exquisite sensibility can well bear, is thus allowed to flow for from three to five minutes in the direction just described. By this application the base of the brain, the spinal cord, and the cœliac plexus of nerves, are simultaneously brought under the influence of the current.

2. *Want of sleep* is one of the chief complaints of patients suffering from rheumatic gout. This arises partly from want of exercise in the open air, and partly from the circumstance that the pain is apt to get worse at night. The patient keeps tossing about in bed from being unable to find a really comfortable position. "Nature's sweet restorer" thus flees the pillow of the sufferer, who generally dreads the night as his worst time. Opium and morphia are rarely applicable in these cases, as they generally excite rather than soothe, and impair the action of the stomach and the liver still more. Hydrate of chloral often steps in as the right thing in the right place; but I believe you will agree with me when I say that the more ample our experience of that remedy becomes, the more frequently do we find cases in which the system does not tolerate it, either in small or large doses. Where morphia and chloral fail to procure sleep, few other drugs will succeed in doing so; and it must, therefore, be looked upon as a considerable advantage connected with the use of the constant current, that under its influence sleep soon becomes prolonged and refreshing. No special application is necessary for attaining this end, the one I have just mentioned being quite sufficient.

3. *Pain* is another invariable symptom of rheumatic gout, and one which frequently resists the administration of sedatives and counter-irritants. Even subcutaneous injections of morphia and atropia have only a temporary effect, which rarely extends beyond twelve or twenty-four hours. The pain is generally most severe in the deformed joints, but is likewise felt in many other parts of the body. For the alleviation of the pain, the constant current is the most useful remedy with which I am acquainted. It must in this instance be applied to the suffering parts, so that the positive pole, armed with a small electrode, is made to touch the sore points; while the negative, connected with a large electrode, is placed in the neighbourhood. The current used may in this instance be somewhat more powerful than where it is employed for general tonic effects; and if a short application, say of one or two minutes, be not successful, this may be extended to four or five minutes. The effect is, in many instances, almost magical, inasmuch as pain, which has been fixed in some particular spot for months and years, is, as it were, charmed away by one or two applications.

4. The *deformities* which rheumatic gout produces, more especially in the interphalangeal joints of the hands and feet, resist the use of the current more

obstinately than the other symptoms which have been mentioned; and it requires much patience and perseverance on the part of the practitioner and the patient to reduce them to any extent. Provided, however, that the galvanic treatment is followed up for a sufficient length of time, even extensive deformities may be improved, which is a matter of considerable importance, as most patients belong to the female sex. No one who has not seen it can have any idea of the beneficial effects which the current will produce in the long run on the deformities, even where they are extensive, and where the patients are not very old. It seems as if the action of the vasomotor nerves were gradually directed back into its proper channel. Unfortunately, many patients want to be cured in a week of a disease which is essentially chronic in its progress; and some practitioners are inclined to discontinue a special treatment too soon, unless immediate effects are produced by it. In this as in many other complaints the ultimate success of a particular plan of therapeutics depends not alone on the remedies which are used, but also very materially upon the more or less systematic use made by the practitioner of his remedies; and last, not least, upon the intelligent co-operation of the patient. In order to reduce deformities, galvanisation of the cervical sympathetic nerve must be had recourse to.

By what I have said I do not by any means wish to imply that the use of internal remedies should be altogether eschewed in the treatment of rheumatic gout. If we were, for some reason or another, to abstain completely from their use, we should only deprive ourselves of many chances to do good to our patients. Although in the system of therapeutics which I have pursued for rheumatic gout, I have given the first place to the constant current, I have frequently prescribed medicines which I thought would prove beneficial for removing certain complications which were present. Thus where there was an excess of acidity in the system, as evidenced by a highly acid condition of the mucous membrane of the tongue, the perspiration, and the urine, I have given alkalies or bismuth; for constipation, I have ordered Marienbad or Frederickshall mineral water; where the blood appeared to be very much impoverished, the ferrum redactum of the Pharmacopœia, or Spa water, was prescribed. All these and some other remedies I have used were, however, only auxiliaries of the galvanic treatment, and could not of themselves have exerted any decided influence upon the progress of the disease.

In conclusion, let me impress upon you once more the necessity of persevering with the use of the galvanic current, if it is to be used at all. The circumstance that most of our patients will be above forty-five, and not a few above sixty years of age, in connection with the obstinate character of the malady itself, must prepare us for slow results, more especially as far as the improvement of the deformities is concerned. Pain, indeed, is often relieved at once, but it is very apt to return; the patient often becomes rapidly stronger, but at times the old debility will again be felt, more especially if he undertake to do more, either in business or pleasure, than he is able to do; and a sleepless night may again occur after many good nights in succession. It is therefore necessary to tell the patient at once that a rapid cure is quite out of the question. The current should be used, either daily or three or four times a week, for at least a month or six weeks; and if the patient continue to improve, we may go on with it much longer than that. If, however, after that time, he does not seem to make any further decided progress, it is better to discontinue the treatment for a month or longer, and then to recommence it. Those who will not shirk the sometimes rather tedious labor involved in carrying out such treatment perseveringly, will ultimately be amply rewarded for their trouble by an amount of success which, in some forms of the disease, could not have been obtained by any other line of treatment.—*British Med. Journal, Sept.* 28, 1872, *p.* 348.

12.—ON A CASE OF ACUTE RHEUMATISM, WITH HEAD-SYMPTOMS AND HIGH TEMPERATURE, SUCCESSFULLY TREATED WITH BATHS.

By Dr. Henry Thompson, Physician to the Middlesex Hospital.

[It was formerly supposed when head-symptoms supervened in a case of acute rheumatism that it was meningitis or metastasis. It is now thought to be hyperpyrexia.]

Beyond question, inordinate body-heat is a destructive agent of great power, and capable of doing a vast amount of mischief to the nervous and other systems; nevertheless, in these particular cases any one who examines the records scattered through the journals and elsewhere, will at once see that the law is this: the nerve-symptoms invariably precede, and the hyperpyrexia, however it may intensify, or seem to intensify, those symptoms, invariably follows. The law may be annulled hereafter; but as far as existing data go, it must stand. The highest recorded temperature on the first accession of the nerve-symptoms in the cases now under consideration appears to have been at most 105·5°. In a large proportion of cases the temperature is below this level, and oftentimes considerably below it. Clearly, then, on the assurance of all past experience, the mischief originates in some profound and damaging impression upon the nervous system—an impression which gives rise at once to the phenomena of cerebral or cerebro-spinal derangement, and to those of exalted body-heat. They are in the main coincident effects of one common cause. I have dwelt upon a point well known to those who, personally or by reading, are familiar with the cases in question, but much misconceived by many intelligent and well-informed persons. Be it so, you will say; but at any rate it is the hyperpyrexia which plays the principal part in the destruction of life. I am not so sure of that. Any one who watched the progress of my own case for many days before the invasion of anything like excessive fever-heat, and took note of the delirium, the tremors, the subsultus, and the floccitation, must have felt assured that the boy's life was in jeopardy, whether the temperature should rise to the height of hyperpyrexia or not; as much in jeopardy as that of any one who presented the same symptoms in enteric fever or in variola. Yes; but the bath, and the wet sheet, and the ice-bag, reduce temperature, and at the same time restore consciousness, or it may be, save life itself. It follows, therefore, you will say, that, as so much good ensues upon the removal of the hyperpyrexia, so, when the result is unfavourable, the hyperpyrexia is mainly responsible for the evil. The reasoning is inconclusive. There may be many factors at work, all conspiring together to compass the death of the patient. If the aggregate of these factors be overwhelmingly strong, there is an end of the matter, and the patient dies; but let the powers of life and death be more evenly adjusted, then the removal of any single factor (say the temperature) turns the scale in favour of life; or, to use a more homely metaphor, takes off the last ounce that is breaking the camel's back. You cannot, then, conclude with certainty, that in fatal cases the hyperpyrexia has done all, or nearly all, the work of destruction, even if you regard the processes of refrigeration as resulting simply in the reduction of heat: still less are we at liberty to draw this conclusion if we change the point of view altogether, and presume (as not unreasonably we may) that our refrigerating agents strike home at the root of the evil, and directly antagonise the first deleterious impression on the nervous system by producing a salutary counter-impression, which controls alike the hyperpyrexia and all the associated elements of death. The evolution of heat may be paramount from beginning to end in sunstroke; but in sunstroke the rule is, that a temperature averaging 107° precedes, and the nervous phenomena follow. In rheumatism it appears to be the reverse. Nevertheless, it is universally believed that a continuous body-heat, ranging from 108·6° to 112°, is absolutely incompatible with life; and I dare not gainsay that belief. Now, in the terrible casesof which I am speaking, the temperature, if unchecked, runs rapidly up to the aforesaid range, and, if unsubdued, must inevitably issue in death. It behoves us, therefore, practically to accept the dogma, that it is the heat which is the main destructive element, and to act upon it at the bedside, whether we believe it or not. We can control temperature, and we are bound to control it. This, in my judgment, is best accomplished agreeably to the plan originated in this country by Dr. Wilson Fox, by the use of the bath at a temperature of 90° or 95° in the first instance, gradually reduced by the addition of cold water to 70°, or even to a lower point in some cases. I confess I have no personal experience of the wet pack and the ice-bag; but many of those who assisted me had such experience, and they all emphatically declared their preference for the bath, as at once the easiest, the most manageable, and the least distressing of all the appliances. In our case, at any rate, the bath was all-sufficient for the purpose required; but it is possible that our case was exceptionally amenable to treatment.

And now, you will naturally ask me whether we are to be perpetually wielding the thermometer, registering temperatures, and constructing charts in every case of acute rheumatism. If we are sure of the ground we have taken, on a foundation of some five years' standing, such a proceeding would be a lamentable loss of time. Recollect what I said about the invariable antecedence of the nervous phenomena in the small minority of the cases accompanied by hyperpyrexia. If, therefore, the law stand fast hereafter, as it has stood hitherto, you may in the main rest contented with the ordinary routine of daily registration two or three times in the twenty-four hours, and wait until one or more of the nerve-symptoms arouse the suspicion of impending peril; but you must give a large latitude of meaning to the term "nerve-symptoms," and you must be keenly alive to everything that can fairly be included under it. I will enumerate all the prodromata of nervous origin that I have been able to gather from my own experience and from the cases recorded within the last five years—at least from those recorded in detail, and bearing conclusively upon the point in question. They are delirium, restlessness, rebellious to treatment, and, it may be, disproportionate to pain; subsultus, tremors, disorderly respiration, stupor, somnolence, deafness, prostration, apathy, strangeness and waywardness of manner, unnatural anxiety and depression of mind; even unnatural gaiety and garrulity. Let any of these sound the note of alarm, and the thermometer, how slight soever its value by comparison hitherto, becomes invaluable now. It is now your bounden duty to apply it many times in the day; how many times it is not easy to say. I will give you roughly my own ideas on the subject as far as they go. If there be delirium alone, or delirium with extreme restlessness, I should recommend the temperature to be taken at least every two hours. I gave these instructions in my own case. It is true the boy was naturally excitable in a high degree, and the case was an unpromising one from the first; but, under any circumstances, I should look upon a longer interval as unsafe, with a certain reservation for the contingency of sleep. After all, your labour will often be lost. Delirium and restlessness, as a rule, pass away, and leave nothing behind; nevertheless, they are now and then true prophets of evil, and their warnings are never to be disregarded. In cases of this nature I should not allow the temperature to go beyond 106° before administering the bath.

As for the remaining prodromata on the list, it is difficult to estimate with precision their respective values: there are two, however, which I should regard with especial misgiving—over-anxiety and stupor. In the presence of stupor, I should take the temperature every hour or every half-hour; indeed, I should look upon the arrival of a climax as all but a certainty, and I should plunge the patient into a bath the moment the thermometer marked 105° or 105·5°. The case is somewhat different with over-anxiety: we might easily alarm the patient by perpetual interference; and it would be obviously inexpedient to disturb a calm and natural sleep, which might fairly be assumed to betoken that all was going on well. Under all circumstances, it is imperative to have the room cleared for action, and the bath and all its appliances in readiness. It is unsafe to be caught unprepared on this first ominous rise in the thermometer, for the interval between the event and the acme of the hyperpyrexia is sometimes fearfully short.

If, in reference to the possibility of overlooking the nervous phenomena, or in order to make assurance doubly sure, you require collateral evidences of approaching danger, I will mention a few symptoms which are held to be of peculiar significance. A dry unperspiring skin; a profuse and intensely red miliary rash; an abatement of the pain and swelling in the joints, or their total disappearance; diarrhœa, and a copious flow of pale alkaline or neutral urine, have all been observed to accompany or to precede the paroxysms; they may even precede the nervous prodromata, specially so called. In our case, a free flow of urine occurred before delirium, and diarrhœa occurred with it. The articular pains, for many days before the outbreak of delirium, appeared in all the joints, and disappeared from all in the most desultory way. Again, during the four days prior to that outbreak, there was a slow rise in the temperature, which on the fourth evening culminated at 104·2°; the pulse-rate, also, during the same period, ruled higher than before; but the complexity and continued severity of the case seemed sufficient to explain these occurrences. An unexplained rise in either direction would certainly be a suspicious symptom: perhaps even a rise of any kind should put us on our guard. Unfortunately, the collateral evidences are all inconstant, but they are useful auxiliaries, and when they appear they ought to awaken attention. Let me remark, by way of parenthesis, that, as I should be vigilant myself, so I should inculcate the extremest vigilance on every one entrusted with the care of the patient; and I should direct the attendants on the appearance of anything strange in his aspect or demeanour, to use the thermometer assiduously, and if ever it rose to 105°, to send at once for the physician.

I have laid down the law that, for all practical purposes, as far as the bath is concerned, we must take the thermometer for our guide. I wish, in some measure, to modify this hard and fast rule. So singularly calming is the bath, even when there is no great exaltation of the body-heat, that I should be disposed to administer it as a simple palliative in all exacerbations of delirium and restlessness, although the heat may have fallen far below its point of maximum intensity, and may register at the time no more than from 102·5° to 104° in the axilla. At a lower level than the above it would not be desirable to use the bath, for such temperature would not allow a sufficient range to cover both the fall within the bath, which we can regulate, and the fall after the bath, which we cannot regulate with exactness; although, from a comparison of Dr. Wilson Fox's cases, I should roughly reckon the average for the after-fall at about four degrees. On the foregoing plan our last bath was administered, when the temperature was no higher than 103·1° in the axilla, and it accomplished its purpose. Perhaps I might have adopted the same plan with advantage during the prolonged agitation which preceded the climax. In this connexion I would remark that, with a temperature descending gradually from 95° or 90° to 70° or thereabouts, the bath is at least as much a warm bath as a cold bath; and warm baths have for ages been recognised as sedatives to the nervous system.

Before dismissing the subject of the bath, it is important to observe that the chest-complications, severe and extensive as they were, including pneumonia, pleurisy, bronchitis, and pericarditis, underwent no perceptible change for the worse in consequence of its use.

With regard to medicinal remedies, opium and hydrate of chloral are the only soporifics and sedatives of any real value. They may be given freely enough during the premonitory period, or stage of suspicion, to control mere delirium or restlessness; but if I saw the danger-signal in the thermometer, I should put on the brake at once and stop the opium for the time being. I might resort to it again if, after the subsidence of the hyperpyrexia, the agitation persisted, and chloral failed to soothe it. Under these circumstances, we cannot afford to dispense with opium altogether; but let it never be forgotten that there is no sharp and unvarying line of distinction between the comatose and the delirious class of symptoms; that stupor may alternate with excitement, and that death by coma is the natural termination of the attack.

In cases characterised by stupor from the first, with or without alternations of excitement, you may apply ice to the forehead or scalp, or the so-called revulsives to the trunk and extremities. I confess I should be afraid of blisters, wherever applied. As the symptoms progressed, I should trust principally to the early employment of the bath, as before stated. In all cases of whatever type, I should feed and stimulate the patient largely, and I should take especial care not to weaken him in any way.

You are aware that modern researches have established for quinine a high reputation as a refrigerant; but in all cases that I have perused, I fail to find an illustration of this reputed power. In my own case, as the boy happened to be doing well, on the principle of letting well alone I was unwilling to alter one iota of the treatment, and so he remained for days and weeks under the influence of quinine, whatever that might be. I cannot determine its value; and the same thing is true of the digitalis associated with it. The possible production of cinchonism is a great drawback to the use of quinine, and might embarrass the prognosis in a class of cases where deafness may be a spontaneous symptom, and a dangerous one.—*British Med. Journal, August* 3, 1872, *p.* 113.

DISEASES OF THE NERVOUS SYSTEM.

18.—SCIATICA, LUMBAGO, AND BRACHIALGIA; THEIR NATURE AND TREATMENT, AND THEIR IMMEDIATE RELIEF AND RAPID CURE BY HYPODERMIC INJECTION OF MORPHIA.

By Dr. HENRY LAWSON, Assistant Physician to St. Mary's Hospital.

[The following is from a review of a work on this subject recently published by Dr. Lawson.]

Dr. Lawson is aware that in recommending his plan, he exposes himself to the charge of treating a symptom only; but, in the case of sciatica, he believes that "the symptom (pain) is the whole disease; and by arresting it we remove the affection." He is of opinion that at present we know nothing of the pathology of sciatica, and that its connexion with that vague class of diseases, neuralgia, is questionable. He is also strongly opposed to the theory that sciatica is an affection of the central nervous system, as its classification among the neuralgiæ by some authors would seem to indicate, but suspects that the portions of the nerve structure primarily attacked, are the delicate filamentous reticulations on the surface of the sarcolemma.

Upon the subject of the treatment of sciatica, the remarks of Dr. Lawson are entitled to weight, as he speaks from personal experience in his own case, of the value of nearly every remedy that has ever been lauded as a cure for the disease; and the conclusion he comes to is, that "the true and *almost the only remedy for sciatica*, is hypodermic injection of minute quantities of morphia." The solution our author recommends, differs somewhat from those in ordinary use; it is simply composed of ten grains of hydrochlorate of morphia, dissolved in two drachms of distilled water, without any acid or glycerine. This preparation is solid at ordinary winter temperatures, and generally so in summer, and, consequently, must be heated before each injection; it possesses, however, the advantage that it escapes decomposition, which so frequently occurs in other solutions. One-sixth of a grain of morphia, *i.e.*, two minims of this solution, is the proper commencing dose. The effects produced by the operation—which it is well to perform immediately after a meal, and in the locality of the pain—are: "absence of pain, intense comfort for a time, prolonged sleep, and increased appetite." These results seldom last longer than twenty-four hours, and it will be well then to repeat the dose, and if requisite, increase its strength. In severe cases, it will be necessary to inject twice a day, and the hypodermic use of morphia may have to be continued for many months. The prevention of the pain of the injection—with some timid patients an important point—may, as the author reminds us, be secured by producing a moderate degree of anæsthesia of the skin by means of the ether-spray apparatus.

Dr. Lawson does not seem to have observed any bad results from the employment of morphia in this form, beyond a sensation of nausea experienced by some after the operation, which, he states, may be relieved by taking food. We regret, however, that he has given no caution against the danger which the prolonged use—or rather abuse—of the hypodermic injection of morphia, may sometimes produce. Although temporary immunity from suffering is always procurable by a sufficiently large dose, yet, in some protracted cases, there is, when the influence of the morphia has passed off, a return of the pain, and a craving for a repetition of the injection, which engenders a "morphia-habit," difficult to abandon, and which, from a reliance upon the hypodermic treatment only, may possibly, as suggested by Dr. Clifford Allbutt, "perpetuate the morbid condition under the mask of a seeming relief." It must not be supposed, however, that although Dr. Lawson believes that 90 per cent. of the cases of sciatica can be cured by the hypodermic injection of morphia alone, he ignores altogether the assistance to be derived from other sources. Cod-liver oil, iron, and quinine, he has found very valuable, in "that they help to maintain the nutrition of the body, which the agonising pain of the malady so greatly interrupts." The employment of alcohol—whether as brandy or whisky—in severe sciatica, is, the author says, "to be uniformly insisted on;" but beer, wines, tea, and coffee, are to be avoided.

In the treatment of lumbago and brachialgia, Dr. Lawson has found the hypodermic injection of morphia as useful as in sciatica.

Herpes zoster, which so frequently accompanies lumbago, and intensifies the sufferings of the patient, is also relieved by the hypodermic injection of morphia, and by painting over the vesicles, immediately they appear, with styptic colloid. —*Dublin Journal of Med. Science, June*, 1872, *p.* 478.

14.—CASE OF TRAUMATIC TETANUS, SUCCESSFULLY TREATED WITH CHLORAL AND BROMIDE OF POTASSIUM.

By Dr. Alexander Fergusson, Peebles.

Tetanus is in itself such a terrible disease, and the issue, especially in the traumatic variety, so commonly fatal, that one aggravated case successfully treated is worth recording. I therefore make no apology for submitting the following interesting case:—

M. D., aged 20, a sawyer, was brought to my surgery on the morning of 19th April last, having sustained an accident to his hand while engaged with a circular saw. The injury was of such a nature as to necessitate my amputating the thumb close to the hand. The operation was done under chloroform, and dressed antiseptically with the utmost care. Under this treatment it cicatrized kindly until the morning of the tenth day, when I was urgently called to his house. I found to my horror the jaws firmly clenched, the characteristic "risus sardonicus" distinctly marked, and the body slightly opisthotonic. The wound was inflamed and painful, and the healthy secretion dried up. A large linseed poultice, slightly carbolized, was applied, and 30 grains of chloral hydrate given, its sedative effect being promoted by a whiff of chloroform. In the evening, symptoms aggravated, the opisthotonos being more complete. Repeated the chloral, increasing the dose by 10 grs. Next morning patient is decidedly better, complains chiefly of præcordial pain extending through to the back, and probably diaphragmatic. Continued the chloral treatment as follows: 40 grs. ter in die, alternately with 30 grs. bromide of potassium bis in die, to every dose of which are added 10 grs. of chloral. Under this plan of treatment, the effects of which resembled chronic alcoholism, the spasms were kept at bay. The only additional treatment was the hot bath with mustard for the first four nights. In the meantime, my friend Dr. Joseph Bell of Edinburgh was asked in consultation, and was so satisfied with the treatment as to recommend its continuance. If the symptoms got aggravated, he advised Calabar bean, of which he kindly left a supply. There is one instance of pathological significance that occurred in the management of this case. One morning, when dressing the wound, I passed my finger along the cicatrizing surface to repress exuberant granulations. It came in contact with a sharp point. This I found on examination to be a small sequestrum of comminuted bone, the removal of which was followed by rapid cicatrization. Such was the treatment exclusively adopted as far as medicine is concerned. The dietary consisted of farinaceous articles, with beef-tea and milk, and small quantities of whisky and soda-water.

Remarks.—There are one or two points of surgical interest in connection with the above case.

The treatment is, I conjecture, novel as regards the use of the bromide of potassium. I was induced to try this remedy for two reasons. In the first place, it is harmless, even in very large doses long continued; and secondly, its therapeutic effects are well known in epileptiform diseases, to which, in the absence of more pathological enlightenment, tetanus seems to me closely allied. At all events, the abatement of muscular spasm, best observed in the trismus, shows that, though pathologically I may be wrong, therapeutically I am right.

The next point of pathological interest refers to the little spiculum of bone, extracted from the cicatrix. Its removal was followed by a very marked remission of the symptoms. I write under correction, but an analogous case I think happened in the practice of Dr. Ebenezer Watson of Glasgow. The removal of a small gravel stone from a lacerated wound of the hand in a tetanic patient was followed by a corresponding abatement. This is surely a point of surgical importance, not to be overlooked in such cases. Here was detected and removed a direct cause of reflex irritation.

My case also exemplifies how chloral may be borne in suitable cases. For four weeks he has taken 120 grs. daily of chloral, and 90 grs. bromide of potassium (in the aggregate 3600 grs. of the former, and 2700 grs. of the latter), without any appreciable effect on the general health beyond transient loss of memory, and the ordinary manifestations attending intoxication. He is now able to walk through his room, but until every sign of spasm has disappeared he will continue to take the chloral.—*Edinburgh Med. Journal, July*, 1872, *p.* 37.

15.—ON A CASE OF TRAUMATIC TETANUS.

By Dr. G. W. Roberts, St. Asaph, Flintshire.

Hugh J——, aged fifty, farmer, a dark, short, thick-set man, on Feb. 16th received a wound on the back of his left hand which was of an extremely lacerated nature. For the first fortnight after the injury he did well until he attended a sale of live stock and got cold. The same evening he complained of great pain in his hand, and also of having a stiff neck. Next morning I was summoned to see him, and found him suffering from great pain in the hand and a contracting pain in the pit of the stomach through to the back; his voice was weak and feeble, and the muscles of the neck and face contracted; pulse 100. I ordered a poultice for the hand, and prescribed a simple saline mixture with ten grains of Dover's powder to be taken immediately. In the evening I was sent for again, and found him attacked with spasms of the trunk and lower extremities. The abdominal muscles were hard and contracted. Spasms were produced by the most trivial cause, such as a draught of cold air by opening the bedroom door. Even the slightest noise made in the room would bring on the most intense tonic spasms of the trunk and lower extremities. These spasms produced complete opisthotonos of about generally two and a half minutes' duration. The features wore a peculiar expression, as if the patient was constantly laughing; the angles of the mouth were drawn downwards and sideways, the forehead wrinkled, brows knit, eyes sunken and fixed, pupils dilated; the pulse was weak, and rose as high as 140; the body was bedewed with a cold clammy perspiration; the temperature rose as high as 107° Fahr.; had great difficulty in swallowing liquids.

My treatment from the first outbreak of spasms was by the subcutaneous injection of a forty-eighth of a grain of solution of atropia twice a day, half-ounce doses of succus every three hours, and half a grain of muriate of morphia at bedtime with the object of inducing sleep. I held a consultation with my colleague, Dr. E. Pierce of Denbigh, who, in addition to the above treatment, advised thirty minims of tincture of Indian hemp every three hours, also a poultice of tobacco and opium for the wounded hand. Strong beef-tea and brandy was administered, which the patient managed to take with very great difficulty. We had also recourse to injection of beef-tea, port-wine, eggs, &c.

On the twelfth day following the first spasm my patient was free from any spasmodic attack, and remained so, but the stiffness in the neck and extremities continued for some considerable time. By the end of April he was perfectly recovered.—*Lancet, Sept.* 7, 1872, *p.* 338.

16.—CHLORAL IN DELIRIUM TREMENS.

By Dr. John Barclay, Banff.

I was called late one night to see a young man who was labouring under this complaint. He had attempted to hang himself, had been rescued, and was then very violent. About half an hour before I saw him he had got half a drachm of solution of morphia, which seemed to have no quieting effect whatever. I then injected hypodermically half a grain of morphia, and waited an hour; but at the end of that time he was still as violent as ever. I then injected half a grain more, and waited for two hours; but even then the violence was, I think, if anything, greater than before. I now sent for a drachm of chloral in solution, half of which I gave him. In ten minutes he was fast asleep, and he slept for ten hours. When he awoke he was slightly collected; he was well fed with strong soup and arrowroot, got the rest of his chloral draught, fell asleep again, and in twelve hours more awoke almost rational.—*Lancet, Sept.* 21, 1872, *p.* 405.

17.—A CASE OF PARAPLEGIA LASTING FIVE YEARS; ELECTRICAL ANÆSTHESIA.—QUESTION OF MALINGERING.

By Dr. W. Moxon, Assistant-Physican to Guy's Hospital.

A lad aged eighteen was admitted into Guy's Hospital (Astley Cooper ward), under my care. He had been sent up from Northampton with the following history: He had fallen from a hay-loft nearly six years before admission, and in consequence of the fall was laid up with weakness of his lower extremities and of his back; he said that his water had been drawn off on account of his inability to pass it. The history which the lad gave was tolerably consistent. He said he had fallen from a height upon his back, and that paralysis of the bladder and lower extremities was the result of the fall, all of which was very likely.

Whenever a paralytic case comes under care one gets an advantage by inducing the person to put out all the effort he possibly can, urging and compelling him to do so. In this way one learns much of the nature of the case by the degree of willingness with which effort is put out, the freedom of the effort in the parts actually moved, as well as, of course, by the kind and degree of the imperfection in the usefulness of the paralysed part.

On making the boy get out of bed, he flopped on the floor, propping himself on his arms and resting on the side of his buttock, with his legs flexed at all the joints so as to be drawn up rather tightly. The legs were remarkably blue and cold, especially below the knees. The suspicious points about the lad's case were—first, the total paralysis he claimed to have; and, second, the defined line around his knees at and below which he declared the sensation to be lost. Under chloroform it was found that his legs, which he said had hurt him to straighten, would stretch to their length quite naturally; and when cautioned to be very careful, at the same time that he was forced to get upright—being held up in the air, in fact, by the arms,—his legs made very promising movements.

Testing the exact line limiting his anæsthesia in the way we employed led to still more doubt. We marked the professed line with ink, then made him shut his eyes, and tried his sensibility to touch above and below it. With his eyes shut he could not keep to his line as he had done most accurately when he was looking at it. It was remarkable, though, how near he kept to it.

The most interesting results were obtained from the electrical excitation of the paralysed parts. The lad was a miserable coward, and got into insufferable terror at the approach of the electrical battery. We did not calm his fears, but gave substance to them by applying the interrupted current so strong that I could scarcely bear it myself, which I endeavoured to do for the sake of appearances. He fairly bellowed when the poles were applied to his arm, the stimulated muscles of which contracted very actively, but I was much surprised to find that when this strong current was applied to his legs below the knees, he gave not the slightest sign of feeling it, and said that he scarce felt it at all, while the muscles contracted so feebly that their reaction was often doubted, and never more than very trifling. The same current applied in the same way to the legs of a man in the next bed, a courageous fellow who willingly underwent the experiment, made him hiss inwards through his teeth, and no effort of will on his part could prevent the muscles from strongly contracting, though he made a very energetic face in the endeavour to resist contraction, whereas the boy's countenance was perfectly placid while the electricity was applied to his legs. The boy had been a fortnight in the hospital before I made this examination by electricity, and had already made considerable progress; first he had stood up holding on to the back of a chair, then pushed the chair before him, and at last lifted the heavy chair, supporting it instead of having it to support him. As all this mending had occurred in a fortnight, and especially as I could not but think that the power required to lift a heavy chair, in the awkward stooping posture the boy always assumed, was far greater than compatible with his claim to be paralysed, I had come to regard him as a shammer. These results of electrical examination, however, made me at the time doubt whether it could be all sham, and led me to expect that perhaps a check in the progress of the case might be anticipated. I therefore adopted a more active treatment than that hitherto used, which had consisted of camphor water and driving behind the chair. The fresh means consisted in the use of silver, administered, not internally, but in the form of sixpences, and accompanied with promises of more. Under all these therapeutical means his progress was wonderful. He left go the chair back and got about on a broom-handle, then learnt to carry the broom. Five weeks after Christmas he ran a very good race with another boy in the hospital park and won the shilling. He is now apprenticed to a tailor in the city of London, and described by his friends as doing well.

This issue of the case I suppose will be taken to show the boy's condition throughout was no other than deliberate deception. I can't help holding that opinion. Under these circumstances the state described in regard of electricity becomes of great interest.

Can we suppose that the prolonged disuse of the limbs had so brought down the sensitiveness of his legs and weakened their muscles that the usual painful contraction was partly not set up and partly not felt? It is difficult to suppose this, seeing that the power of the will found its way into his legs so soon and thoroughly as the story shows. Nevertheless, I cannot suggest any more likely explanation of the difficulty, and we must remember that although recovery was quick it was gradual. I should, however, have said that in the latter few weeks the electrical current was used to the boy's legs; but the recovery was by that time complete. I ordered the electricity only for its moral effect; yet some may be disposed to think that that helped the cure.

But as my belief is that the lad was malingering, I think the chief interest of his case lies in its showing that want of absence of reaction to the electrical current does not prove a paralysis to be real; while the whole history shows the power over such cases which one may exercise by firm and persevering pressure upon the patient's will, keeping up a sufficient friendliness in the time.—*Lancet, July* 6, 1872, *p.* 7.

18.—GUARANA A REMEDY FOR SICK-HEADACHE.

By Dr. Samuel Wilks, Physician to Guy's Hospital.

I wish to draw the attention of the profession to *guarana* as a remedy for sick-headache, and at the same time to ask for the experience of those who may already have some acquaintance with the drug. My own knowledge of it dates about two years back, when, after the appearance of a lecture of mine upon sick-headache, I received a letter from Mr. Helmcken, of British Columbia, enclosing two powders which he recommended to me with much confidence as able to cure the complaint. He said that, having heard much of the remedy, "I resolved to try the medicine upon one of my patients who was always coming to me with sick-headache; and sure enough it acted like a charm; and in place of suffering for twenty hours or so the headache had disappeared in a couple. This accords with what others have told me." Upon my first headache after the receipt of Mr. Helmcken's letter, I took the powder, but with only doubtful effect. I therefore did no more than casually mention the medicine to my friends, but did not recommend it. A few weeks ago, after the appearance of a second communication of mine in the Journal upon the same complaint, I received a letter from Dr. Wood, of Montreal, in which he also recommended "guaranà" as a remedy for headache, and gave a history of his own personal sufferings and the relief which he had obtained. He says, "By taking one of these powders, and remaining quiet, when I have felt premonitory symptoms by a beginning of pain always in the right temple (headache on the other side, or in any other part of the head, I never mind), I have carried off the attack; and, with the first box, absolutely put it off for two months, something which had never occurred in my life before." Upon so good an authority, I determined to try the remedy in a more systematic manner, and requested my neighbour, Mr. Hooper, the chemist, to procure me a packet of the powders. These I have recommended to several patients and friends; and the result is so encouraging, that I have hastened to suggest their trial to my professional brethren. One lady speaks most enthusiastically of their power, as she has now, on two separate occasions, had her headache arrested by their use. The drug has long been known, for mention is made of it in English and French pharmacologies, but appears never to have come into general use. It consists of the seeds of a tree growing in Brazil called *Paullinia sorbilis;* and these, according to Johnstone, in his *Chemistry of Common Life*, are used as we do cocoa. The seeds are ground into powder, and contain an alkaloid, which is said to be identical with that found in tea and coffee. The medicine is manufactured by Grimault & Co., No. 7, Rue de la Feuillade, Paris. —*British Medical Journal, April* 20, 1872, *p.* 421.

19.—GUARANA POWDER A REMEDY FOR SICK-HEADACHE.

By Dr. P. W. Latham, Physician to Addenbrooke's Hospital, Cambridge.

The above-mentioned remedy, to which Dr. Wilks called attention in last week's journal, has for some time been a favourite one in France for sick-headache, as well as for various forms of neuralgia, given in doses of ten to fifteen grains or more of the powder once or oftener in the day. It is now also, according to Dr. Herman Lebert, coming into use in Germany (*Handbuch der practischen Medicin*, 3te Aufl., 1863, Bd. ii, s. 632).

The following account (abridged from Posner's *Handbuch der klinischen Arzneimittellehre*, 1866, p. 189) may not prove uninteresting to those who are desirous, on the recommendation of Dr. Wilks, of giving the remedy a trial, and who may wish to know something of its properties.

The plant *Paullinia sorbilis* is a native of Brazil, and belongs to the natural order Sapindaceæ. The seeds, roasted, bruised, and pressed into cylindrical masses, constitute the guarana paste, which, when freely pounded, is then known by the name of Paullinia powder. This is light brown in colour, has an odour faintly resembling roasted coffee, and a bitter astringent taste. It contains, in addition to empyreumatic oil (developed by the process of roasting), and tannic acid, guaranin, a substance identical in composition with caffein. The large proportion of tannic acid in its composition renders its action very efficacious as an astringent; whilst, owing to the guaranin, it has much the same effect on the nervous system as tea or coffee.

Therapeutically, Paullinia powder is employed, not only as stated above, to act on the nervous system in sick-headaches and various forms of neuralgia, but also as an astringent in catarrhal diarrhœa, and in blennorrhœa of the urinary organs. In infantile diarrhœa some regard it as specially indicated, since, besides acting as a styptic, it may serve as a nutrient. The best form of administration is either as the simple powder alone, or mixed with an equal quantity of sugar. The kind of sick-headache most likely to be benefited by the remedy is probably that occurring in persons of a hysterical temperament. —*British Medical Journal, April* 27, 1872, *p.* 446.

20.—BROMIDE OF POTASSIUM IN EPILEPSY.

Dr. Legrand du Saulle has published the results of the administration of bromide of potassium in two hundred and seven cases of epilepsy. Headache, gastric disturbance, disturbance of sensation, and other troublesome symptoms have been described as following the use of the remedy, but these he has not found to occur when the drug has been pure. When the quantity taken daily reaches 4 grammes (ℨ j), the reflex sensibility of the fauces, epiglottis, and root of the tongue, and the sensibility of the generative organs are diminished. Acne then also appears; which is not, however, as has been represented, of critical importance. Dr. Legrand du Saulle commences with a gramme and a half or two grammes daily, and increases the dose gradually to 6 or 9 grammes a day; in one case in the course of twenty-six months the increase was 14½ grammes daily. In men, no result may be observed till the daily dose reaches 4 or 5 grammes; in women, 3 or 4½ grammes daily will sometimes produce distinct effects. Of 207 epileptic patients treated with bromide of potassium, all symptoms of epilepsy ceased in 17, who were under observation during three or four years; 28 remained free from one to two years; in 33 there was marked improvement; in 19, the intervals between the attacks were increased, and these were less severe; in 110, there was no result. Dr. Legrand considers that it is not safe to entirely omit the use of the bromide, even when there has been no epileptic attack for a year. The patients, however, must be watched; for, under prolonged use of bromide, mental disturbance, stupor, confusion of ideas, impotence, and acne are apt to set in. The last-named affection has sometimes disappeared under the use of arsenic simultaneously with the bromide of potassium.—*Gazette des Hôpitaux, and British Medical Journal, August* 3, 1872, *p.* 126.

21.—MAGNETO-ELECTRICITY IN THE TREATMENT OF MUSCULAR ATROPHY.

By Dr. Alex. P. Fiddian, Cardiff.

Whilst the value of electricity in the treatment of disease is a matter of dispute, a case where there is distinct evidence of its utility may be considered worthy of publication, and for this reason the following is brought forward. The patient (J. L., Bute Docks, Cardiff), to state the matter summarily, was paralysed to an extent fast approaching completeness. Both upper limbs were affected, so that he was quite helpless; yet in six weeks from the time he was first seen he was enabled to walk fairly well, and in five months more active than he had ever been. A detailed account of his condition and of the steps taken for his recovery is given as follows:—

August 19, 1871.—J. L., aged twenty-six, pilot, is a single man and a sober one. Has been much exposed in his occupation necessarily; and also, because of his eagerness to do all that came to hand, was often at work night and day. Was not subject to rheumatic pains; never had syphilis; but was always a strong, healthy, stout-hearted fellow. Strange to say, he has had an aversion to meat, and has not eaten any for years as an article of diet; he has lived almost wholly on bread. For at least a twelvemonth has been subject to constipation, and to relieve it has consumed large quantities of Epsom salts and of pills—in fact, whenever he could lay his hands on "salts" they were sure to disappear. Up to nine weeks ago he considered himself to be a picture of health, but about that time as he was walking to town he felt as if struck in the calves. In a way unaccountable to himself, he seemed gradually to lose the power of walking—tottered, and finally ceased to walk within three weeks of the attack. His feet and legs lost their sensibility and their power. Then his thighs and forearms lost their power, but not sensibility.

He has used a great variety of applications, external and internal, but every day the disease seemed to grow upon him; and, except in the matter of sensibility, his condition has all the time steadily become worse, and the same constipation, which for the last twelve months has been a trouble, during the last nine weeks has been aggravated. His appearance is that of a strong, healthy man, but he cannot shake hands with anything like a good grasp. His first complaint is that he cannot stand, for his knees give way at once, and if taken out of bed he must be supported. He cannot lift either foot from the bed, but in trying to do so raises the knee a few inches. He cannot flex or extend either foot or move his toes. He can only turn in bed with the greatest difficulty and clumsiness. His hands, too, he complains of as quite useless, for he can neither grasp a book nor unbutton his shirt, nor hand his food to his mouth. He makes no complaint about his arms, and, indeed, he moves the forearm upon the arm or the arm at the shoulder-joint with his usual freedom and force. No reflex action is observed on tickling the soles of the feet, nor is any twitching observed in either arm or leg.

Tremulousness characterises every movement. Swelling comes in his feet and legs if he allows them to hang down; otherwise they are much like sticks. His thighs are small and flabby, especially on the inside. His hands are thin, and the bones prominent; there is decided flattening between the thumb and first finger. His forearms are small and offer a contrast to his arms. Sensation as tested by pin's point at varying distances is good everywhere.

To make the diagnosis complete, the magneto-electric machine was used, and as it was applied in the same manner as was afterwards found necessary in the treatment, a statement of the manner will not be out of place here. The machine used was the common electro-magnetic, with a single large magnet, and the strength of current was regulated roughly by drawing out the keeper. Wet sponges were placed within the conductors, and were applied to the skin in such a manner that the sponges alone touched its surface. Each superficial muscle was electrified in turn, by simply placing the wet sponges on it so as to cover as large a portion of the one muscle as possible, and the application lasted for about two minutes. By this means it was found that the muscles of the forearm, though feeble in their response, were much more active than those of the thigh and leg, hand and foot. Those of the thigh were more active than those of the leg; the hand was better than the foot. It was difficult to perceive any movement in the latter with the most powerful current he could bear. A good idea of the feebleness of muscular power in the leg may be gathered from the fact that with all the anterior tibial muscles acting together the foot just moved.

It must also be noted that in certain situations, however much the sponges were wetted, the application was very painful. Thus, on each calf, where mustard poultices had been applied, no amount of wetting could rob the electricity of its pain-producing power, when sufficiently strong to make the muscles contract. Over the buttocks, too, where no mustard poultice had been applied, sensibility was still more acute, and remained so the whole time, whereas that of the calves disappeared after a fortnight. The dorsum of the foot and the back of the hand were also very sensitive.

A diagnosis was then made, to the effect that the muscles were atrophied without any affection of the spinal cord or motor nerve trunks; that the disuse of the muscles was adding to their atrophy, though not the primary cause.

A prognosis on the strength of this was given to the effect that the limbs would regain their power, but that time and patience would be largely drawn upon.

A plan of treatment was also determined—namely, to electrify each muscle every day (the whole taking two hours or more) for about two minutes; to take three times a day a mixture containing three minims of liq. strychniæ for a dose, and to increase the dose gradually. (He went up to eight minims.) Also a stimulating liniment to be rubbed into the legs.

After a week the liniment was given up, because of a rash it had produced, and at the same time he was put on full meat diet. He ate heartily of beefsteaf and eggs. No beer, spirit, or wine was ordered.

His progress was as follows:—

August 24. Can lift left leg to the height of one foot, and right leg to height of six inches.

26th. Able to stand with the help of one hand.

30th. Can feed himself, rise up from sitting posture, stand a moment without help, and grasp without trembling. Calves and shins filling up. Can flex and extend left foot.

September 1. Able to undo buttons of his sleeves.

5th. With his hands can lift a large quarto book.

9th. Walks from one room to another with help.

16th. Bowels moved twelve times in twenty-four hours; therefore liq. strychniæ was omitted, quantity of food reduced, and chalk mixture given.

25th. Walked downstairs and up again with help. No diarrhœa for several days past.

October 4. Able to walk with one stick, to flex each leg, to point each foot without flinging it about. Bulk of legs and thighs increases. Without producing pain, no contraction of the extensor brevis digitorum takes place. Resumed liq. strychniæ, four-minim doses.

20th. Able to walk a short distance without stick. Walked across the road for first time. Notable increase in steadiness of limbs.

28th. By occasionally touching the wall is able to walk a considerable distance without his stick. Power of hands as great as that of many men, but not equal to his former self. Muscles of leg, thigh, buttock, and forearm of their natural size and firmness. Those of hands still show room for improvement, as well as those of the foot. There is an advantage decidedly in favour of the hand. Able not only to button his shirt at the wrist, but also at the neck, where he can have no help from his eyes. Uses both knife and fork in eating. His feet have never swelled since August 19. This was the last time electricity was applied.

November 5. With his own hand wrote to say he was gaining strength daily, and going into the country for change of air—Cheltenham.

April 7, 1872. Returned from Cheltenham, where he had taken certain baths and rapidly gained in walking power; then took to his occupation, and pursued it more vigorously than ever, keeping to his new diet of meat. Latterly has been for a short tour to Scotland, leading all the while a most active life. No defect can be noticed of any kind.

The first question to be answered is, whether the electricity was the remedial agent? It evidently was, and for these reasons. Up to the time of its application the limbs were steadily growing worse. The patient, with a concern that deepened every day, had watched the wasting and flabbiness and weakness of his legs extend upwards to his thighs. From the time of its application they made uninterrupted progress towards recovery. It may be objected that the strychnia was as powerful an aid as the electricity, and so I might have thought had I not learned afterwards that he had been taking it previously in just as large doses as I gave him, if not larger. Further, had the improvement in his diet a material connection with his recovery? It no doubt aided materially, but was not the starting-point; for when it was adopted a marked improvement had already begun. Having watched the case most carefully, I feel convinced his recovery was due to the electrical agent. The time expended was considerable; but a point of more importance is, whether the daily and prolonged stimulus does not produce a state of irritability. On the contrary, it turned out that what was borne with difficulty at first, was borne with ease afterwards. At first, I hardly knew how to make its application mild enough; at last he could bear more force than I could command.

With regard to the cause a good deal might be said about hard work of muscle, with deficiency in meat diet, and about degenerate structure; but enough has been said to mark out the value of electricity, and its claim on our attention as a remedial agent.—*Med. Times and Gazette, July* 20, 1872, *p.* 66.

22.—ON AUDITORY VERTIGO (MENIERE'S DISEASE).

By Dr. J. Hughlings-Jackson, Physician to the London Hospital and to the Hospital for the Epileptic and Paralysed.

There is a class of cases in which the symptoms, superficially regarded, appear to point to disease of the central nervous system, but which are really owing to affections of the ear. It is very important to bear in mind that severe paroxysmal vertigo may be entirely independent of primary changes in the nervous centres, and yet dependent on a peripheral nervous lesion. Every physician will have seen cases of deafness and tinnitus attended by vertigo and occasionally by that grouping of more severe symptoms called Ménière's disease. But I do not think we are sufficiently alert to the frequency of this association of symptoms. I must confess that I did not properly realise the extreme importance of carefully considering the state of the ear in cases of vertigo until I had read Knapp's paper. Knapp not only speaks of what I may call the "ear part" of these cases, but enters into a consideration of the whole of the symptoms in a manner which makes his observations of quite as much interest to physicians as they are to aural surgeons. He draws attention to the desirability of studying aural diseases in connexion with eye diseases. This I would strongly urge.

It is not difficult for a careless observer to pass over the associated deafness in cases of vertigo. For, strangely, patients often do not know that they are considerably deaf of *one* ear; and, stranger still, will sometimes persist that they are not, until a special examination convinces them that they are.

I will now give a sketch of the grouping of symptoms which constitutes what is called Ménière's disease.

Tröltsch ("Treatise on Diseases of the Ear, translated by St. John Roosa") says of Ménière's disease—"Ménière, in the year 1861, drew attention to a series of most remarkable cases which appeared in the form of an apoplectic congestion of the brain, with sudden vertigo, vomiting, great singing in the ears, and a fainting condition, and which frequently left behind a certain impediment in motion, a continuing unsteadiness in standing and walking, and thus gave the surgeon from the beginning an impression of a congestive affection of the brain; but the constant recurrence of all these disturbances, and the fact that there generally was a very remarkable difficulty in hearing, for which no assignable change in the ear could be found, decidedly proved that there was an affection of the internal part of the organ"—(*op. cit.*, p. 503). Ménière believed it to be most probable "that the material change which lies at the foundation of these disturbances has its seat in the semicircular canals"—(Tröltsch, *op. cit.*). He arrived at this conclusion, in some measure, by reasoning from the well-known physiological experiments of Flourens. I shall avoid the temptation of speaking of these experiments, partly because they can be read in text-books of physiology (see especially Vulpian, who, in his "Physiology of the Nervous System," devotes a lecture to "Mouvements de Rotation"), and partly because their bearing on Ménière's disease has already been many times discussed (see, for instance, the writings of Tröltsch, Knapp, Brunner, and Duplay).

I will, however, mention the interesting speculation of Goltz in reference to the functions of the semicircular canal, again borrowing from Knapp (*op. cit.*, p. 224):—"Czermak found that pigeons, after injury of the semicircular canals, frequently have vomiting. Goltz confirmed that the animals thus injured have vertigo, and dwells on a rational explanation of these remarkable phenomena. If the auditory nerve and its expansion in the labyrinth, he argued, were merely subservient to the sense of hearing, this could not satisfactorily account for the surprising disturbances of motility. He arrives at the conclusion that the two fascicles of the auditory nerve have different functions: the cochlear fascicle is the nerve of the special sense of hearing, but it is questionable whether the semicircular canals are also organs of audition. Being subservient to the maintenance of poise, *they are*, as it were, *the organ of the sense of equilibrium of the head, and thereby of the whole body.* Goltz gives a highly interesting analysis of this theory, explaining how he imagines the maintenance of equilibrium to be effected by the semicircular canals. The terminations of the nerves in the ampullæ and canals are excited by pressure or tension, like the tactile nerves of the skin. The liquid in the semicircular canals—endolymph—according to physical laws, distends most those portions of the wall which lie deepest. The pressure from the fluid varies with the movements of the head, so that a determined nervous excitement corresponds to every position of the head. The perception and consciousness of the special nervous excitement by the brain constitute the sense of equilibrium, which serves as a regulator of the movements. If a portion of the semicircular canals is injured, the brain receives inaccurate information of the position of the head, and is unable to calculate and direct its movements correctly. This is the cause of the vertigo and the disturbance of motility." Goltz thought that if the lesion of the semicircular canals is of but one side the troubles will be only temporary, but if of both sides, they will be permanent—(Duplay, *op. cit.*).

Even if it be granted that the semicircular canals are the parts in fault in Ménière's disease, they may be only *secondarily* so; they may be, indeed, only *suffering* from some fault in the more external parts of the aural apparatus. Increased pressure (resulting from stoppage of the meatus by wax, by catarrh, acute or sub-acute, and purulent processes in the cavity of the tympanum), "transferred from the stapes to the vestibulum, must necessarily place the semicircular canals in an abnormal state of pathological irritation"—(Tröltsch, *op. cit.*). In other words, the *primary* changes may be in the non-nervous part of the ear. It is only in suddenly occurring cases that we can suppose symptoms of Ménière's disease to depend on primary changes in the labyrinth itself. Politzer (quoted and indorsed by Tröltsch, *op. cit.*) says—"If a person who has formerly heard well *becomes suddenly* deaf, or hard of hearing, with the symptoms of an apoplectic attack, and there is at the same time an uncertain and staggering gait, but there are no symptoms of paralysis in other nerve tracts, and if the examination shows a normal membrana tympani and perfectly permeable Eustachian tube, we may believe, *with great probability*, that there is an affection of the labyrinth"—(Tröltsch, *op. cit.*, p. 507). (No italics in the original.)

Further, Knapp (*op. cit.*, p. 236), who has reconsidered the whole subject in a most able and original manner, believes that the pathological changes in Ménière's disease are *not confined to the semicircular canals*. The accompanying deafness, he thinks, shows that the cochlea is also involved. There is sometimes, he has pointed out, deafness for certain groups of tones. "It is a *contraction of the range or field of audition*, as we have contractions of the field of vision. The latter is observed in different eye diseases, but the kind found in *glaucoma* most resembles the contraction of the range of audition." He says, also—"*Deafness for certain groups of musical sounds is proof positive that the disease is neither limited to the acoustic nerve outside the Labyrinth nor to the semicircular canals and vestibule, but that it extends to the Cochlea*" (capitals in original). It is admitted by most physiologists that the perception of musical sounds depends on the cochlea and probably on the fibres of Corti. "Helmholtz believes that the acoustic expansion of the vestibule and in the ampullæ serves for the perception of the non-periodical or irregular vibrations—that is, for ordinary sounds, but that Corti's fibres in the cochlea are designed for the perception of the periodical movements of the air—that is, for the musical tones. According to Helmholtz, the tuning (*Stimmung*) of the latter is different, and corresponds to the regular gradation of the musical scale. The perception of different heights of tone is therefore a perception or sensation in different nerve-filaments. In this view, the different quality of the auditory sensations or perceptions as to the height of tone and sound-colour (*Klangfarbe*) must be referred to the variety of the nerve-fibres which is excited."—(Troeltsch, *op. cit.*, p. 509).

I will now conclude these remarks—or rather, I ought to say, this compilation—by the following extract from Troeltsch:—"One of the most valuable contributions to the science of nervous deafness we owe to late French investigators, especially to the late Dr. P. Ménière, of the Paris Deaf and Dumb Institute, who was altogether one of the most meritorious workers in the province of aural surgery."—*Medical Times and Gazette, August* 17, 1872, *p.* 169.

DISEASES OF THE ORGANS OF CIRCULATION.

23.—THE RELATIVE FREQUENCY OF DISEASE BETWEEN THE RIGHT AND LEFT SIDES OF THE HEART.

By Dr. Cornelius Black, Corresponding Fellow of the Imperial Society of Physicians, Vienna, &c.

If the question were asked, "Which side of the heart is the more frequently affected by disease?" the answer in perhaps nine cases out of ten would be that the left side of the heart is the one which more frequently suffers. This answer would not, however, embrace the whole truth. It would be true of the aggregate of cases of cardiac disease without reference to age; but it would be untrue if the occurrence of cardiac disease were referred to the later periods of life. If a man lives to the age of forty years without having suffered from cardiac disease, and if after that period the heart becomes affected, the mischief will, as a rule, be found to exist on the *right* side. If, on the contrary, cardiac disease should occur before that age, the disease will almost invariably be found to exist on the *left* side. Hence it follows that the right side of the heart is the seat of cardiac disease occurring after middle age—the left side of the heart the seat of cardiac disease occurring before middle age.

As in time, so it is with respect to the nature of the diseases which affect the right and left sides of the heart respectively. Those of the right side are the result of tissue-degeneration, or of mere mechanical influences; those of the left side are almost invariably the product of inflammation. The former are diseases which tend to widen the valvular apertures and to dilate the right side of the heart; the latter are diseases which tend to contract the valvular apertures and to increase the size and bulk of the left side of the heart.

Disease of the right side of the heart is essentially passive and secondary in its character; disease of the left side of the heart is essentially active and primary in its character. I speak now of disease when it occurs, not when it has existed for some time. Active inflammation of the left chambers of the heart arises; it progresses to a certain extent; treatment subdues it; the patient recovers; but a certain amount of damage is left behind. Years pass on; the patient during this time appears none the worse for his previous illness; but at length pulmonary symptoms suddenly manifest themselves, and then it is that the physician discovers that the left side of the heart is permanently damaged, and that the present condition of the lungs is traceable to this cause.

In this instance the mischief in the heart inducing this condition of the lungs is not, strictly speaking, active. The first step of the cardiac disease was active; but the second step was chronic. Bit by bit—increment by increment—after the patient's apparent recovery from the primary attack, is the valvular lesion left by such attack added to, not perhaps constantly, but intermittingly, until at length the aggregate increments of addition so hamper, oppress, obstruct, and distort the mitral and aortic valves, that secondary consequences begin to follow.

In such a case the cardiac disease producing the first degree of valvular lesion was *active*, or *acute;* whilst that which really induced the secondary consequences—congestion of the lungs, hæmoptysis, hypertrophy of the lower lobes, or hypertrophy of the left ventricle—was essentially chronic.

Why are the affections of the two sides of the heart essentially different in their nature? Why do those of the left side of the heart point to an inflammatory origin; those of the right side of the heart, with but few exceptions, to a non-inflammatory origin? There must be some cause for this difference. What is it? The reason is found in the difference which exists between the constitution of the blood which reaches the left side of the heart from the lungs and that which reaches the right side of the heart from the general system. The blood reaching the left side of the heart from the lungs has been replenished with all the elements necessary for the growth of the tissues; it has been purified, renovated, and vivified by its oxygenation in the lungs, and it is thus rendered in the highest degree stimulating to the left heart. The blood reaching the right side of the heart from the general system has been deprived, by the requirements of growth, of the chief portion of its nutrient materials; it has been fouled by the débris of tissue-waste; it has been further poisoned by its impregnation with carbonic-acid gas; it is therefore a depressant, rather than a healthy excitant, to the right heart. True, it brings with it to the chambers of the right heart the products of the digestion of food; but what are they, either as nutrients or excitants, when they reach that point? They are no more than inert, unusable, passive elements. Not until they have passed to the lungs, and have there received the vivifying influence of oxygen, can they enter into the real composition of the blood, and thus become active, exciting, disposable constituents of it.

"Like begets like" in very many instances. This axiom is true in relation to disease of the heart. The rich, stimulating blood of the left ventricle urges, feeds, and actively supports any disease which may arise at that point; whilst the poor, impoverished, fouled, tainted, and attenuated blood which flows through the cavities of the right heart favours disease of a correspondingly low and degenerate character.

So long as the body is rapidly built up and as rapidly pulled down, disease of the left heart maintains an active character; but when the balance between nutrition and waste is destroyed—when nutrition becomes less active, whilst waste remains the same, or is more active than before—disease of the left heart loses more and more of its active character, and approximates more and more in its nature to disease of the right heart. In many this change begins at the age of forty; in others, not until five or ten years after that period. Thenceforward the tendency to inflammatory disease of the left heart declines—the tendency to degeneration increases. With the gradual declination of the one tendency and the gradual increase of the other, a period is at length reached when active inflammatory disease ceases, as a rule, to affect the left heart. At this juncture the left and right sides of the heart, hitherto dissimilar in their tendencies, are in this respect almost as one. The active tendency of early life has given place to the passive tendency of advancing years—inflammation to degeneration.

Acute rheumatism—a fruitful cause of cardiac disease in the earlier periods of life—is seldom seen beyond the age of fifty. I have, however, attended a case of acute articular rheumatism at the age of seventy-five; but such an instance was an exception to the rule. After fifty, acute rheumatism gives place to a form of rheumatism which slowly produces rigidity of the coats of the bloodvessels, hardens and contracts the tendons, thickens and renders stiff and rigid the ligaments of the joints, hardens and lessens the articular cartilages.

Thus, then, according to a law of nature, the *ultima linea* of life ends in—degeneration.

Apart from the influence of this law, can any accidental, casual, or avoidable circumstance favour this immutable tendency to degeneration, speaking more particularly in reference to the heart? Yes; many circumstances are daily, hourly, momentarily doing this. Thousands annually perish from heart disease, whose lives might and would have been prolonged had but proper attention been given to the simple laws of nature. Those laws demand attention to the three great vital functions—the action of the brain and nervous system, respiration, and circulation.

None of these functions must be overworked, as none of them must fall short of their proper duty. Healthy, regular, daily action is their law of life. If the brain and nervous system are overworked, vitality is lowered, the resisting power of the body is diminished, disease is easily produced. If the brain and nervous system are underworked, the generation of nervous power is low and deficient, the vitality of the tissues becomes low in proportion, and disease is easily excited. Overwork exhausts, ruins, kills the body, just as the continued generation of the galvanic current exhausts the acid and wears out the zinc plate. The weakest point of the body has to bear the result of this violation of nature's laws. If the heart is that point, disease falls upon it, and death before the legitimate term of man's existence is the consequence.

To keep the body in perfect health it must be duly oxygenated. There must be free and ample interchange between the blood in the lungs and the air entering the pulmonary cells. The life-stream must be purified by its elimination of carbonic acid; it must be vivified by the absorption of oxygen. The fulfilment of these conditions demands a full, free, and constant admission of pure air into the lungs. This full, free, and constant admission of pure air cannot be obtained in badly-ventilated houses, crowded buildings, schools as at present constructed, theatres, manufactories, pits, underground railways, and the like.

When the body has reached that age at which natural decay or degeneration has begun, the absence of pure air hastens and increases the degenerative tendency. Where the heart is more prone than other organs to disease, the want of pure air falls with powerful effect upon the tissues of the right heart. Their nutrition is defective by reason of the impurity of the blood with which they are fed, their vital force is lowered, their muscular fibre loses its tonicity, degeneration and debility take the place of active nutrition and power. If in this condition any stress is thrown upon the heart by hurried walking, by lifting, climbing, violent declamation, passional expression, singing, laughing, or by any unusual exercise of the voice, the tricuspid valve gives way, it henceforth fails to close its aperture, and the results of a back-flooding of blood upon the venous system of the body begin to follow. If none of these exciting causes occur, the continued breathing of impure air is followed by constantly progressing degeneration of the tissues of the valves and muscular structure of the right heart; they become soft and feeble, their atoms shrink; the segments of the tricuspid are at length unable to meet in their attempt to close their aperture; a small chink or slit is left between them; through this the blood finds its way into the auricle above at every contraction of the heart; and soon regurgitation is followed by the secondary consequences produced in the general system—congestion of the liver, stomach, spleen, kidneys, bowels—by hæmorrhoids, general dropsy, and occasionally by cerebral mischief.

I hold that the breathing of impure air is a fruitful source of disease of the right heart occurring after middle age. How many people ignorantly favour its occurrence by confining themselves to closely-shut, non-ventilated, hot, stiflng rooms, in which the carbonic acid has accumulated to two or three per cent. of the air they respire! How many are thus destroyed by being compelled, through the exigencies of life, to pass the greater part of their time in pits and manufactories where ventilation is defective, or in which the air respired is poisoned by noxious fumes and offensive emanations from the materials undergoing the process of manufacture! How many are falling victims to the poisonous influence upon the heart of the atmosphere of an underground railway! What do these facts suggest? How are these evil results to be prevented? The simple answer is—Let the rooms in which you live be effectually ventilated by an incoming current of air filtered from all adventitious impurities, and so divided that no draught shall be felt; and by an outgoing current which shall remove from the apartments the carbonic acid, carbonic oxide, sulphurous-acid gas, sulphuretted hydrogen, and other noxious compounds, as rapidly as they are generated. Apply the same principle to public buildings, theatres, schools, manufactories, pits, and to all places in which people are accustomed to congregate.

As to underground railways, the best plan is to avoid them. True, the time passed in their polluted atmosphere is usually very short; but it is, nevertheless, sufficiently long to paralyse occasionally the heart's action, and always, by its pollution of the blood and by its direct effect upon the nervous system, to favour degeneration of the structures of the heart.

It often occurs to a medical man to visit a patient for the first time, and to find him suffering from a dilated right heart, tricuspid incompetency, some degree of hepatic enlargement, and œdema of the lower extremities. There is no asthma, no emphysema of the lungs, no affection whatever of those organs to impede the onward flow of blood from the right ventricle, no history of cardiac affection in earlier life. The patient may for some short time have been sensible of a change in his breathing on walking rather quickly, or in mounting the stairs, or he may never have felt, or at least recognised, any such sensations. His attention was first arrested by observing that his feet and ankles were swollen, especially at night on going to bed. This sign it is which gives him the first alarm, and which causes him to seek the aid of his physician. An examination of his case detects a dilated right heart, with incompetency of the tricuspid valve. How has this condition of the heart been brought about? There is no history of previous cardiac disease; there has been no illness ushering in the present condition of things; there has never been, nor is there now, any affection of the lungs, and yet the right heart has suffered a lesion fatal to life! The answer is, that every such case has passed the age of forty, that the tissues of the right heart have entered upon the period of degeneration, and that this degeneration has, with very few exceptions, been hastened by the breathing of an impure air, either during the pursuit of ordinary occupations of life, or in the patient's own dwelling.

When the degeneration of the right heart has progressed to a certain extent, incompetency of the tricuspid valve follows either with or without the aid of an exciting cause. Hence it is easy to understand why dilatation of the right heart and tricuspid incompetency are often found to exist apart from any previous history of cardiac disease.

The third great vital function which influences the degenerative tendency of the heart is that of the circulation of the blood. To preserve the health of the tissues, the blood must not only be pure and rich in the materials of growth, but it must flow with a certain speed through all the bloodvessels. If the speed with which the blood moves is on the side of either *plus* or *minus* of the standard of health, disease will shortly arise. If it is on the side of *plus*, active disease of the heart, where that organ is the one to suffer, will follow. If on the side of *minus*, tissue degeneration will ensue. Active disease will be the consequence before middle age; degeneration after that period.

These facts teach that all violent and long-continued efforts of the body should be avoided. They hurry the heart's action to an inordinate degree, they cause it to throw the blood with great force into the extreme vessels, and, as there is almost always one organ of the body weaker than the others, the vessels of this organ became distended, and remaining distended, the organ itself becomes diseased. Running, rowing, lifting, jumping, wrestling, severe horse-exercise, cricket, football, are fruitful causes of heart disease. Those which require the breath to be suspended during their accomplishment are more fruitful causes in this respect than those which require no such suspension of the breathing. Rowing, lifting heavy weights, wrestling, and jumping do this; and of these, rowing is the most powerful for evil. At every effort made with the hands and feet, the muscles are strained to their utmost; the chest is violently fixed; no air is admitted into the lungs; blood is thrown by the goaded heart with great force into the pulmonary vessels; they become distended; they at length cannot find space for more blood; the onward current is now driven back upon the right heart; its cavities and the bloodvessels of its walls become in like manner distended; the foundation of disease is laid. Hypertrophy, hæmoptysis, inflammatory affections of the heart and lungs, are the consequences in the young; valvular incompetency, rupture of the valves or of the muscular fibres of the heart, pulmonary apoplexy, and cerebral hemorrhage, are too frequently the immediate consequences in those of more mature years.

If the flow of blood is *minus* the standard of health, the heart's walls are imperfectly nourished by reason of a deficient supply of food within a given time; the blood itself, receiving less aeration, is in consequence more impure; degeneration of the heart's walls is thus induced, if it does not already exist—hastened if it is present.

[The relative frequency of disease between the right and left sides of the heart depends as a rule upon age. The left side suffers more before forty, and the right after that age. Diseases of the left side are the result generally of inflammation, diseases of the right of tissue degeneration.]

According to the ordinary law of life, tissue-degeneration, or natural decay, usually begins at the age of forty; with its advent, the left side of the heart becomes less prone to inflammatory disease, and approaches more and more closely in its tendencies to the diseases of the right side of the heart; and the degenerative tendency of the latter is, after this age, greatly influenced by the three great vital functions—the action of the brain and nervous system, respiration, and circulation.

It is thus shown that, to maintain the heart's structures in as healthy and sound a condition as they could possibly be maintained under the law of natural decay, these vital functions must neither be overworked nor fall short of their necessary duty—that, in fact, regular, natural action is their law of life.

I have shown the effect of impure air in promoting the degenerative tendency in the structures of the heart, and especially in those of the right side of the heart, after the age of forty. I was thus led to a passing consideration of the baneful influence produced upon the heart by badly ventilated houses, schools, manufactories, pits, theatres, underground railways, and all places of a similar character.

To this point I return, to show the influence of an increasing quantity of carbonic acid in the air respired upon the contractility of the muscular fibres of the heart.

I take for my example the newly-hatched trout. During the winters of 1869–70 and 1870–71, I hatched some thousands of this fish, many of which I daily submitted to microscopic examination. The result of my investigations, in reference to the action of the heart and to the influence upon it of a decreasing quantity of oxygen and an increasing quantity of carbonic acid in the water in which the fish was confined, shows,—

That, on placing the fish in a glass trough containing a quantity of water, the heart is seen, under the microscope, to be affected in the following manner:—

In the first few moments of examination the venous blood, collected by the veins from the head, back, and yelk-bag (the first two of which unite to form a bulbous vessel into which the third opens), is seen to be projected with considerable force and rapidity into the upper (auricle) of the two cavities of which the heart is composed, and thence as instantaneously into the lower (ventricle) cavity, which contracts with equal rapidity, and forces the blood into the branchial artery, which conveys it to the gills. The projection of the blood into the auricle, its passage into the ventricle, and its expulsion therefrom, are but the work of an instant. As the blood enters the auricle both it and the ventricle seem to anticipate the charge of blood; but especially is this the case with the ventricle. Before the blood well touches the valve which guards the entrance from auricle to ventricle, the latter is observed to shorten its longitudinal diameter, to visibly meet, as it were, the coming charge of blood from the auricle, and to force it instantly into the branchial artery. There is no delay whatever of the blood in the auricle or ventricle. It is shot in a straight line from the vena cava through the auricle and the auricula-ventricular valve, caught by the contracting ventricle, and deflected and forced, without a moment's delay, into the branchial artery.

From these observations it was evident that the contraction of the heart was not excited by the distension of its cavities, but that it was induced by the mere impingement of the blood upon its lining membrane. In contracting the ventricle was seen to roll about one-third upon its axis, by which a portion of that part of it which was previously out of sight was brought into view. As soon as it had delivered its blood into the branchial artery, it relaxed and increased again its longitudinal diameter, recoiling from systole with an energy and a rapidity equal to those of its contraction.

In three or four minutes the heart is observed to contract both less quickly and less energetically. A very short time after this the boold can be seen gently pouring into the auricle, and thence into the ventricle, which latter now allows itself to be about one-fourth filled before it contracts. It now expels its blood, and again dilates; but its dilatation, like its contraction, is not so instantaneous as it was when first observed under the microscope. In a short time longer the sensibility of the heart is greatly diminished, for the blood is seen to be accumulating in both the auricle and ventricle, but especially in the former, from both of which cavities it is now only partly expelled by the contraction of the heart.

At length, just before death, the blood is seen to flow from the auricle into the ventricle, thence into the branchial artery and along it, the heart being passive during this time, and only now and then at long intervals manifesting a very slight and partial contraction. During the whole of this time the blood is coagulating more and more in the auricle and ventricle, but especially in the former; and when at length the heart has ceased to beat, the auricle and the vena cava opening into it are fully distended, whilst the ventricle is only partly distended with black-red blood. In the last moments of life, after the heart has ceased to beat, the branchial artery is seen to be pushing forward its slender current of blood, and to become at length quite empty and transparent.

Here, then, as the oxygen dissolved in the water in which the fish is confined becomes exhausted, and as the carbonic acid increases, the sensibility and contractility of the heart are diminished, and at length entirely destroyed. The negation of oxygen, and the increase of carbonic acid, have culminated in the death of the fish.

Precisely the same effect is produced upon the human heart by an accumulation of carbonic acid in the air respired.

In the ordinary condition of the atmosphere, in which carbonic acid does not exceed one part in a thousand parts of that medium, its effects upon the heart are inappreciable. When, however, the carbonic acid has accumulated to the extent of one per cent. of the air respired, it begins to produce a slight feeling of faintness, and some degree of uneasiness across the brow.

At 2 per cent. the heart's action is quickened, the sense of faintness is greater, there is slight giddiness, with heaviness and constriction of the head, together with nausea. At 3 per cent. all these symptoms are increased. There are vertigo, fluttering of the heart, nausea and sickness, followed by an overwhelming sense of muscular prostration. At this moment the contractions of the heart become very feeble, the skin relaxes, and is bedewed with a cool, clammy perspiration. These symptoms deepen with the increasing quantity of carbonic acid in the air respired until the utmost limit of toleration is reached, beyond which life can no longer be maintained. At this stage lethargy supervenes; and, at the moment of its occurrence, the heart begins to beat less frequently, and much less powerfully than before. This condition is the parallel of that observed in the young trout, when the blood begins to accumulate and to coagulate in the auricle and ventricle, and when the heart's sensibility and contractility are reduced to the greatest degree.

From these effects it is certain that confinement to an atmosphere impregnated with carbonic acid, even to the extent of one per cent. only, quickly deranges the function of the heart, and ultimately deteriorates the tissues themselves of that organ. The greater the percentage of carbonic acid in the air respired, the more quickly and the more profoundly are these effects produced. The constant breathing of air containing one per cent. only of carbonic acid proves fatal to life; but if it is respired for a short time only, functional disturbance alone is then and there produced. *It is, however, certain that in this functional disturbance lie the germs of organic mischief, and that frequent repetition of the cause will undoubtedly end in organic disease. Hence the impure atmosphere of the bedrooms of the poor, and, indeed, of many of the middle class, proves a sharp spur to the degenerative tendency manifested by the heart, and especially by the right side of the heart, after the age of forty.* Such bedrooms are generally small in their superficial area, low-pitched, and often lighted by a diminutive window, which at night is kept constantly closed; and having a door which opens to the interior of the house, but which is also closed during the occupation of the rooms. Nay, to prevent the slightest admission of fresh air, the crevices of both window and door are most carefully stopped; and, to render the matter still worse, a fire is not unfrequently kept burning during the winter nights.

What must be the effect produced upon the air of such rooms under the conditions named? I take for example an average-sized bedroom in the cottages of the poor—say, a room twelve feet long, ten feet wide, and eight feet high. This gives a cubical space of 960 feet, which is not more than half the cubical space allowed each patient in our best arranged hospitals. In this room, with its diminutive window and door constantly closed, three, four, and frequently a greater number of persons pass the night of eight or ten hours' duration. No provision has been made for the admission of fresh air—none for the escape of the carbonic acid exhaled during respiration. What little provision did exist in the crevices formed by the badly-fitting door and window has been carefully abrogated by sand-bags, rolls of rags, and stuffing of every description. Thus the air of the room becomes poisoned with carbonic acid, and in this condition it is breathed and re-breathed, to the manifest injury of the heart.

A simple calculation will enable us, if not to determine with exactitude, at least to approximate to the amount of carbonic acid exhaled by each sleeper, and consequently to the degree of vitiation which the air of the apartment undergoes. I fix the number of respirations at its minimum—14 per minute; the quantity of air exhaled at each expiration at 20 cubic inches; the quantity of carbonic acid contained in the expired air at 4 per cent.; and the duration of the night at eight hours. Hence $14 \times 20 \times 8 \times 60 = 134400$ cubic inches, or 77·77 cubic feet, of air expired by each sleeper during the night of eight hours. This expired air contains 4 per cent. of carbonic acid. $\therefore 100 : 77{\cdot}77 :: 4 = 3{\cdot}11$ cubic feet of carbonic acid exhaled by each sleeper during the night. Suppose the number of sleepers occupying the bedroom to be four, this will give $3{\cdot}11 \times 4 = 12{\cdot}44$ cubic feet as the quantity of carbonic acid which is exhaled by the four sleepers during the eight hours of night. The room itself contains 9·60 cubic feet of air, and through this 12·44 cubic feet of carbonic acid would have been diffused by the termination of the night. It therefore follows that, if no fresh air entered the room, and if in consequence the carbonic acid had no means of escape, the air of the apartment would, at the end of the eight hours of night, contain 1·29 per cent. of this gas: a quantity sufficient to produce serious results.

This statement, however, does not represent all the facts of the case. It must be remembered that the oxygen contained in the air of the room would be constantly undergoing reduction by respiration during the night. If the quantity thus consumed were determined from the quantity of carbonic acid exhaled, allowing for the fact that 15 per cent. more oxygen is taken into the blood than is contained in the carbonic acid of the air expired, it will be found that from one-third to one-half of the oxygen originally contained in the air of the room would have been consumed by the end of the night. This reduction in the quantity of oxygen, and the great increase of carbonic acid, would affect the body in two ways—firstly, by a deficiency of oxygen, and secondly, by an excess of carbonic acid, in the air respired. Hence the reduction of the one and the increase of the other would render the air far more injurious than if only one of these changes in its constitution had taken place.

The actual result is not, however, in strict accordance with this calculation, because fresh air, although in limited quantity, does find its way into the room, and carbonic acid does, to a limited extent, find its way out. These, therefore, would modify the constitution of the air of the room at the close of night; but they would still leave it with an excess of carbonic acid injurious to life.

It is found that when air moderately impregnated with carbonic acid is inspired it greatly impedes the exhalation of more from the lungs; and that the greatest quantity of carbonic acid which exists in pre-breathed air never exceeds 10 per cent. It is much to be feared that to this degree of vitiation the air of the bedrooms of the poor and of others not unfrequently rises by the too prevalent system of excluding fresh air, and by the frequent absence of provision for the escape of that which has already passed through the lungs.

Can it then be a matter of surprise that death from diseased heart should so often occur during the night?

In thousands of instances of cardiac disease life is thus sacrificed, where had but proper ventilation of the bedrooms been observed, the subjects of such disease might, despite the cardiac mischief, have continued to live for an indefinite time.

It has frequently been my duty, during a practice of nearly thirty years in the midst of a large community prone by the habits and particular avocations of the people to heart disease, to investigate cases of "found dead" in bed; and I have often been compelled to refer the immediate cause of death to the effect of carbonic acid liberated by respiration and confined to the apartment, in destroying the sensibility and contractility of the heart, rather than to the direct influence of the diseased heart itself.

I remember that on one occasion I was summoned to a case which had occurred in a bedroom 15 feet long, 12 feet wide, and 8 feet high. In this room, with the door and window closed, no fewer than twenty persons slept night after night! Can any one doubt that the air of such a room would be charged to excess with carbonic acid exhaled by respiration? Those who perished in this manner were beyond the age of forty; and, in every instance examined, the right side of the heart was either primarily affected by tissue-degeneration, or by disease consecutive to mischief in the left side of the heart and lungs.

Often indeed in the dwellings of the middle and higher classes of society the provisions for ventilating both their bedrooms and their day-rooms are miserably inadequate to preserve health. The consequence is that cardiac disease is promoted to an inconceivable extent. *There is no other disease in which the demand for cold, fresh air is so urgently pressed by the patient as in cardiac disease. There is none in which a constant supply of pure air is more needed—none in which it is more grateful to the patient, or in which it has a more immediately beneficial effect.* At all times and seasons—in the depth of winter—by day and by night—a patient suffering from a paroxysm of cardiac asthma will hurry to the open door or window, and there, with his body hanging half out, will remain, with scarcely any vestments upon him, breathing the cold air, until the paroxysm has ceased. Ought not this urgent, this powerful supplication of nature to teach us the importance of ventilation, and of a full supply of fresh air in the treatment of heart disease?

I hesitate not to say that free ventilation—the free admission of pure air into the apartment by day and by night—is one of the most important remedial measures which can be adopted in the treatment of this disease.

Where this means is defective, but where, nevertheless, the vitiation of the air of the bedroom does not exceed one per cent. of carbonic acid, a sensible effect is produced upon those who have slept within its influence. They complain, on leaving their bed, of weakness; their limbs tremble; they feel somewhat giddy, and their head feels heavy, or it aches. The least effort disturbs the heart's action, which is somewhat quick and feeble; their countenance is pale; the lips are not unfrequently somewhat blue; and the tongue is covered with a thin, whitish, and somewhat slimy fur. The appetite is in abeyance; there is a feeling of nausea; and the first evacuation is generally dark in colour.

What is the pathological condition of such patients at this moment? Simply this. The blood contains an excess of carbonic acid, which, circulating with the blood through every organ, disturbs the natural action of every organ, blunting its sensibility, vitiating its particular function, and interfering with those molecular changes which constitute healthy nutrition.

A person thus affected does not usually die. The body, removed to a pure atmosphere, begins at once to excrete the carbonic acid by the lungs, the liver, the skin, the kidneys, and the bowels, and in the course of a few hours the more visible manifestations of its baneful effects have passed away. It however often happens that a sense of weariness and muscular debility is felt for days afterwards. Night, too, frequently places such subjects in the same condition as before. The same bedroom is occupied; the same inadequate means of ventilation continue; the same accumulation of carbonic acid takes place; and the same effects upon the bodily organs are repeated. Blood charged with an excess of carbonic acid again pervades every tissue of the heart, diminishing its vitality, lowering its sensibility, and assimilating its nutrition to that of the reptilian heart. But the low character of the nutrition of the reptilian heart does not accord with the comparatively quick circulation, rapid nutrition, vital power, and energy of action required by the human heart. The one cannot be substituted for the other. In man the change results in disease where disease does not exist—aggravates disease where it is already present.—*Lancet, Aug.* 24 *and Sept.* 7, 1872, *pp.* 253, 329.

DISEASES OF THE ORGANS OF RESPIRATION.

24.—ON ASTHMA.

By Dr. C. J. B. Williams, F.R.S.

I call your attention to a group of affections which go under the title of *asthma.* This word is commonly used as synonymous with dyspnœa, or difficult breathing; but it is more convenient and practical, as well as correct, to restrict it to those kinds of difficult breathing which are accompanied by audible *wheezing.* Here is at once a great practical distinction from the dyspnœa of pleurisy, of pneumonia, of diseases of the heart, and of diseases of the blood (anæmia and toxæmia)—these are all *panting,* or *gasping,* with breath short and frequent, but with little or no wheeze. The dyspnœa of *asthma,* on the other hand, is, essentially *wheezy* and *prolonged,* affecting the inspiration, or the expiration, or both. This is most distinctly witnessed in spasmodic asthma and pulmonary emphysema; but it applies more or less to severe bronchitis and bronchial catarrh, which carry with them more or less of the asthmatic wheeze.

The simplest, as well as the most characteristic variety of these, is the purely spasmodic asthma. A person subject to this may be attacked suddenly on entering a close or dusty room, or inhaling the fumes from a stable, the odour of ipecacuanha, or other smells in peculiar cases; or, more commonly, he awakes in the middle of the night with a feeling of oppression approaching to suffocation—referred by some to the throat, by others to the sternum, by others to the epigastrium—obliging the patient to sit up in bed or in a chair, with the elbows rested on the knees, the shoulders elevated, and the head bowed forward, but all labouring to the utmost in strong prolonged efforts of inspiration and expiration. This painful struggle for breath may last from a few minutes to several days, according to the severity of the paroxysm; and frightful as it seems to witness, and distressing to the patient, yet it is not dangerous; sooner or later the tight breath is relaxed, cough and expectoration sometimes accompanying its relaxation.

Seeing how violently all the muscles of inspiration and expiration partake in the struggle of a severe paroxysm of spasmodic asthma, we cannot much wonder at the notions of older writers on the subject (Bree and others), that the disease depended on an excessive and convulsive action of all these muscles. Laennec first pointed out the true pathology of asthma in tracing it to a spasmodic contraction of the bronchial tubes, which so much impedes the ingress and egress of air in respiration as to call for excessive and violent action of the respiratory forces to effect it. In this temporary constriction of the bronchial tubes we see the immediate cause of the difficult breathing; and this, too, is the cause of its most characteristic sign—the loud wheezing, whistling, piping, and cooing sounds which attend the paroxysm.

The correctness of Laennec's view of spasmodic asthma had, however, been called in question by several writers, who opposed to it the very daring assertion that the bronchial tubes do not really possess muscularity. The supposed muscular fibres, which had been demonstrated by Reisseissen, were declared not to be muscular at all, but merely elastic, and therefore could not be the seat of spasmodic contraction. To settle this question, about twenty years ago I made a series of experiments on animals, and they proved beyond a doubt not only the muscularity of the bronchial fibres, but also the kind and degree of irritability which they possess. Under the influence of a galvanic, mechanical, or chemical stimulus the circular fibres of the bronchi contract readily but slowly, and gradually relax when the stimulus is withdrawn. The contraction is more tardy than that of the œsophagus, but more prompt than that of the arteries, and relaxation does not follow for some minutes after. Like other muscular contractility, it becomes exhausted after continued stimulation, and it is recovered by a period of rest.

Although it has been generally admitted that my experiments have clearly proved the muscular contractility of the bronchial tubes, yet from the remarks of recent writers on the subject it appears to me that the physiological offices of this property have not been generally understood. Thus it has been supposed that the bronchial muscles contribute to the rhythmical process of expiration; but if they do so at all it can only be to a slight extent, as their movement is much slower than that of ordinary respiration, besides which it appears to be limited to the larger and middle-sized tubes, and does not extend to those of smallest size. A galvanic current caused little or no contraction when passed through a lobe within an inch or two of its margin; but the contraction was marked when the current was passed along any of the tubes of the size of a small crowquill upwards. I cannot, therefore, concur in the notion propounded by Dr. Gairdner in one of his able papers, that the finest bronchi have a peristaltic or vermicular motion like that of the intestines, and that this is the chief means by which fluids are expelled from these tubes. It is probable that ciliary motion contributes to this end, but the expulsion of mucus and other fluids from the bronchial tree is mainly effected in the manner which I pointed out more than twenty years ago—by the rapidly increasing velocity with which the air in expiration passes from the pulmonary cells to the narrower converging bronchi, and carries with it any loose liquid in its way. The air in entering the lungs passes with decreasing velocity and force as it spreads into the minute tubes and cells, the combined area of which vastly exceeds that of the large branches and trunk of the bronchial tree. On its return in expiration this is reversed; the motion is more rapid and forcible as it converges towards the trachea and glottis, where the process is brought to its consummation in special efforts of expectoration and coughing. This draining operation of the expiratory act is promoted on the one hand by increasing the force of the act by muscular effort; and, on the other, by a moderate contraction of the tubes, which augments the velocity and sweeping power of the air in passing through them. This contraction is effected by the bronchial muscles, which thus assist in the process of clearing the tubes. But if these muscles act in excess, they render the passage too narrow both for free expiration and for expectoration; and this is just what occurs in the asthmatic spasm, which renders these processes slow and difficult. This is the view of the function of the bronchial muscles which my experiments led me to entertain, and which I published and taught in my lectures more than twenty years since. Dr. Hyde Salter, in his late able and elaborate work on asthma, proposes a like opinion, and suggests that the bronchial muscles may also be useful in impeding the entrance of irritating matters into the lungs.

But the most interesting fact discovered by my experiments, with regard to this bronchial contractility, was that it is influenced differently from that of other muscles by various poisonous or medicinal agents. Thus, hydrocyanic acid did not impair it at all, opium and morphia very little, conium and aconite a little more, but belladonna and stramonium almost destroyed it; so that in animals poisoned by these drugs the bronchi showed scarcely any signs of contractility when stimulated. In animals poisoned with strychnia the bronchi seemed permanently contracted, so that a stimulus had no further effect. This is another proof of the antagonistic action of strychnia and belladonna. Now, it is well worthy of remark that the action of these several drugs on the bronchial tubes is quite different from what it is on the œsophagus and intestinal canal. Thus, in animals poisoned with belladonna the œsophagus was as irritable as ever; in those poisoned with opium, on the other hand, the contractility of the alimentary canal is much impaired. This fact has led me to give belladonna in preference to opium in cases of intestinal colic with constipation, and with a far more satisfactory result. I think this mode of investigation worthy of attention as a means of extending pathological and therapeutical knowledge. We want a more elementary study of the operation of medicines, an examination of the effect of simple drugs on the functions of elementary tissues, and on the constituents of the blood; for without this we cannot hope to understand the operation of complex medicines on the whole frame.

To return to the pathology of spasmodic asthma; there is, then, no reason to doubt that a continued contraction or tonic spasm of the muscular fibres of the bronchi—constriction of these tubes—is the essential characteristic of this disease. No doubt the contraction of the bronchial, as of other muscles, is controlled by nervous influence; and many of the phenomena of spasmodic asthma exemplify the reflex action of the nervous system in exciting the spasm—for example, mental agitation or irritation of the stomach by indigestible matter will often bring on a fit of asthma—but the nervous element is often not obvious in the clinical observation of the disease. Thus, spasmodic asthma often affects persons, not otherwise nervous, when they inhale peculiar smells or when they catch cold; and in my experiments I found that irritating the eighth nerves had little effect on the contraction of the bronchial muscles, which, on the contrary, readily answered to direct irritation. But it is open to further inquiry whether, like the heart and arteries, these contractile fibres are not more influenced through the sympathetic than through the spinal nerves.

However induced, this constriction of the tubes renders the ingress and egress of air to and from the lungs difficult and noisy, so that the process of breathing becomes very laborious and prolonged; all the muscles of inspiration, ordinary and supplementary, are called into violent action, and so the struggle goes on until the spasm is relaxed. If this takes place soon the attack ceases and there is no remaining disorder; but if the spasm lasts long other disorder ensues in the bronchial membrane and other parts concerned. They become congested from the imperfect and laborious breathing, and this congestion causes increased and disordered secretion; hence cough and expectoration of a catarrhal character commonly accompany or follow a prolonged fit of asthma. So, likewise, if these asthmatic attacks recur frequently, they tend to produce more permanent congestion and thickening of the air-passages, which continue in the intervals between the attacks, and thus the disease passes from the paroxysmal or intermittent asthma into a more habitual or constant asthma, with which is associated more or less of the general dilatation of the air-cells, called by Laennec emphysema of the lungs. I will allude to this again afterwards.

Spasmodic asthma, or bronchial spasm, may originate like a common cold or bronchial catarrh, or from exposure to the effluvia of a hayfield, of a stable, of a close room, of ipecacuanha, or of other dust; or it may arise from some unknown impurity or peculiarity in the air of certain places; or it may be induced by indigestion, by gouty or other irritating matters in the blood, or by mental emotion. The kind known under the term of "hay-asthma" is very common, and I have no doubt is excited by pollen-germs, or some effluvium from flowering grass and other vegetables. It is more distinctly catarrhal in nature, being often preceded or accompanied by sneezing, coryza, and other symptoms of membranous irritation. But in whatever way asthma may have its origin, when it has once occurred, it is very apt to return again, and may be re-excited by any of the causes just mentioned; and, generally speaking, the more frequently it recurs, the longer and more severe are the attacks, and the more likely to leave the breathing embarrassed in the intervals.

But you may well ask, further, "What is the peculiarity that makes persons asthmatic?"—that is to say, that makes the causes above-mentioned excite in them contraction of the bronchial muscles, instead of causing the more common effects resulting from the operation of these causes on persons in general. We may reply, "A peculiar irritability of these muscles or of the nerves exciting them." But this is only an expression of the fact, and does not explain why these muscles should be more irritable in asthmatic persons than in others. This subject requires more investigation. I do not feel that I can answer it fully, so as to include all instances; but I think that I have traced in several cases signs of a slight structural peculiarity which may give to the bronchial muscles an unusual liability to spasm. This may be designated under the general term of *a slight induration or thickening at or near the root of the lungs.* In a considerable number of those subject to attacks of asthma, even at an early period, when they are few and far between, I have found, in the absence of the paroxysms, more or less of whiffling or tubular sound in one or both interscapular spaces, generally most in expiration. This may be from enlarged bronchial glands, which are of common occurrence in children, often accompanying enlarged tonsils; or it may be from interstitial deposit under the mucous membrane at or below the bifurcation of the trachea; or it may be from slight partial induration of the pulmonary texture, such as that resulting from an old tuberculous lesion, whether in the form of dwindled and contracted tubercle or calcified induration, but of very limited extent. Either of these lesions, trifling as they may be in extent, may increase the irritability of the bronchial tubes, not only by mechanical irritation, but by partially obstructing the circulation underneath the tubes, and thus throwing more blood to the muscular fibres and mucous membrane. It is in favour of this view of the pathological cause of the asthmatic spasm that such changes to an increased extent certainly do occur after often-repeated and severe attacks, and operate as the causes of their continuance and aggravation. In cases of confirmed and habitual asthma we have abundant evidence, both during life and after death, of the increased vascularity and thickening of the mucous membrane and subjacent tissues, which changes we shall afterwards find to be concerned in producing the general emphysema of the lungs which usually supervenes.

Spasmodic asthma is of common occurrence in childhood, and is then frequently complicated with eczematous and other eruptions on the skin. So, likewise, in adult life it often occurs in connection with gout and psoriasis, all being dependent on a morbid material in the blood; and this point should be kept in view in the treatment.

Few complaints vary in their tractability more than asthma. Some (even severe cases) yield to treatment so promptly and permanently that their cures may be ranked among the great successes of medicine.

From what has been said, it may be inferred that the treatment of asthma must vary much in its simplicity and success according to the unity or complication of the disease. Against the bronchial spasm we have remedies which are pretty effectual in most cases. Belladonna and stramonium rarely fail to relieve the bronchial spasm; and in transient cases, where this is the only element, they may suffice to cure the disease. The extracts are the most reliable preparations, and may be given in doses of from a quarter of a grain to half a grain every three, four, or six hours whilst the tendency to spasm lasts. The dryness of the throat which both these drugs often cause may be counteracted by frequently sipping linseed-tea or barley water. Sometimes, however, this dryness is useful in moderating the catarrhal flux which may follow the spasm.

But in most cases there exists something more than the mere spasm; and, therefore, we commonly have to give these anti-spasmodics in combination with other remedies. Thus, often there is an inflammatory cold, calling for the addition of salines and counter-irritation; and this may amount to bronchitis, requiring the aid of small doses of tartarised antimony. In chronic cases, when the attacks have recurred frequently or lasted long, there is no combination more beneficial than that of iodide of potassium, in two or three-grain doses, and ten or fifteen grains of bicarbonate of potass, with the stramonium or belladonna. I believe that I speak within bounds when I say that, with a combination of this kind, I have cured or greatly relieved hundreds of cases of asthma. The efficacy of the alkaline iodide probably depends on its eliminative and deobstruent action, increasing the secretion of the kidneys and of the bronchial membrane, and promoting the absorption or dispersion of the thickenings and deposits in the tubes, bronchial glands, and at the root of the lungs, which I have mentioned as being often concerned in exciting or perpetuating the attacks of asthma. The diuretic or eliminative action of these medicines may be advantageously increased in some cases by the addition of squill, colchicum, or tincture of cantharides, particularly where there are indications of gout or of disease of the skin. On a similar principle, in chronic cases certain mineral-waters are sometimes useful, particularly those of Eauxbonnes and Cauterets in the Pyrenees, Vichy, and Ems.

There are several other remedies for asthma in common use, generally much inferior in efficacy to the preceding, but occasionally useful as subsidiary aids, and sometimes they are our chief resources where those disagree. Such is the ethereal tincture of lobelia, which in doses of from twenty to sixty drops I have known in a few instances quite successful; more frequently it has failed, and sometimes caused much nausea and discomfort. Indian hemp, in doses of a grain of the extract, gave signal relief in two instances, where the usual remedies had disagreed; but in other cases it has quite failed, and has sometimes caused distressing disturbance of the brain and heart. Smoking cigarettes of stramonium, or of the *datura tatula*, inhaling chloroform (which for safety should be mixed with sulphuric ether and alcohol), and breathing the fumes of burning nitre-paper, are expedients which often give relief in individual cases; and although this relief is less complete and permanent than that following the use of the remedies first recommended, yet they may be useful where these fail, and, being prompt in operation, may be employed to ward off slight attacks where stronger agents are not required, or before the latter can be brought into effective operation.

Rarely we meet with cases of asthma so severe and obstinate as to resist all medicinal remedies; or it may be that the patient becomes tired of taking medicines, and renounces them in disgust—nay, sometimes I have known the symptoms aggravated by those which are commonly the most successful. In some of these change of air has succeeded wonderfully, and this not always when the change has been of the most salubrious character. In fact, the caprices of asthma with regard to air are very curious, and can hardly be accounted for. In most instances, however, a dry atmosphere agrees better than a damp one, and the air of a large town better than that of the country, especially if this be low and damp. Of places in which I have known asthmatics most free from attacks I would mention London (several parts of the West-end), Tunbridge Wells, Clifton, Brighton, and Margate (in summer); abroad, Paris, Pau, and Hyères. But asthmatic subjects should try for themselves, and remain as much as possible in the locality that they find by experience to best suit them. In the case of hay-asthma, the avoidance of the country during the hay-making season is necessary with many individuals, and the change found commonly to answer best is either to London or the seaside.—*Medical Times and Gazette, June* 8, 1872, *p*. 649.

25.—ON VESICULAR EMPHYSEMA OF THE LUNGS, AND HABITUAL ASTHMA.

By Dr. Charles J. B. Williams, F.R.S.

The effect of extensive and long-continued emphysema on the blood and its vessels is manifest in the leaden pallor of the surface, contrasted with the dark congested state of the mouth, fauces, and larynx; the right cavities of the heart become enlarged, the liver, kidneys, and other organs partake in the livid congestion, and their degeneration not uncommonly follows; the arcus senilis generally appears early; and albuminuria, anasarca, and general dropsy usually precede death.

But it must not be supposed that these extreme results occur in all cases of emphysema. In more moderate degrees emphysema occurs in connection with chronic bronchitis, and with the slight pulmonary congestion accompanying organic diseases of the heart, and, merely adding an habitual shortness of breath and wheezy cough to these affections, may be regarded rather as an infirmity than as a very serious disease. The function of breathing and circulation in such individuals is reduced to a reptile standard; and if they can be contented to remain within their limited sphere of activity, slowly and quietly creeping their way, and not attempting in any sense to bustle, to run, or to hurry, they may live for many years in tolerable comfort.

It may be inferred, therefore, that the successes in the treatment of confirmed emphysema or chronic asthma will be chiefly of the minor class, amounting to mitigation or alleviation rather than perfect cure, and failures are to be expected in those intense and aggravated cases, in which the distension of the lung is so great and lasting as to cause much wasting and degeneration of its tissues. But there is a period in which the emphysematous distension of the lung is removable. If the causes which produce the incarceration of air in the cells (shortening and partial obstruction of the air-tubes, and thickening of the lung around them) can be taken away before the structure of the air-cells is altered by their continued distension, the lung may return to its natural condition and dimensions. Something of this kind commonly takes place after extensive bronchitis, in which there is more or less temporary emphysema. Still more does it occur after severe fits of spasmodic asthma, which induce more or less temporary emphysema; but the cause being transient, the lungs recover their normal dimensions. Now, it can be well understood that between these temporary varieties of emphysema and the confirmed and advanced disease there are intermediate degrees which may be removed or ameliorated by appropriate treatment.

Among the remedies chiefly useful are those employed as expectorants of the more stimulating class—squill, salts of ammonia, ammoniacum, and other gum resins; benzoin, tolu, and other balsamics; creasote, and other terebinthinates. Some of these exhibited through the stomach, others by way of inhalation with the vapour of hot water or in spray, tend to excite the secretion and expectoration of bronchial mucus, and thereby to diminish the obstruction to the egress of air from the distended cells. Often their operation may be aided by the iodides and bromides of potassium and ammonium and alkalies, before mentioned as useful in recurring asthma. The employment of stimulating expectorants in bronchitis and emphysema requires careful judgment and discrimination; for if given too soon, or during any inflammatory or febrile exacerbation or fresh spasm, they do harm instead of good. In fact their operation is always the opposite of that of the remedies for recent bronchitis or spasmodic asthma (salines, antimonials, belladonna, &c.), and it becomes beneficial in consequence of the bronchial muscles and membrane passing into somewhat of an opposite state—inflammatory irritation having given place to passive congestion, and spasmodic contraction to atonic or paralytic relaxation. So, too, with this change belladonna, stramonium, and salines fail to give relief, and are even hurtful. And yet the transition from one condition to another is neither constant nor uniform; and it often happens that at one time of the day there may be distressing cough, with difficult expectoration and the long crepitant respiration of an atonic state of the tubes; and at another time the tight wheezy breathing, inspiration and expiration, of spasmodic asthma. Nay, sometimes these opposite conditions may co-exist in different parts of the same lungs, and entirely baffle our efforts to counteract them.

The most common case, however, of these opposing conditions is that the atonic state prevails throughout the day, and more or less of the spasm recurs at night; and therefore it often answers well to give stimulant expectorants and even tonics during the day, and a dose or two of antispasmodic or narcotic in the night.

I have just named tonics, and they require a little further notice with regard to their influence on these diseases. Like other affections which impair sleep and appetite, and exhaust strength, continued asthma or bronchitis wastes flesh and blood; and therefore ordinary reparative tonics, such as iron and quinine, may be often useful to sustain the failing general strength and structure of the frame. But certain tonics seem to have an invigorating influence on the muscles of respiration, external and internal, and may to a certain extent restore the breathing powers, when these have been impaired by prolonged attacks of dyspnœa and cough. I allude especially to strychnia, zinc, and arsenic. In several instances the continued use of strychnia (in doses of from 1-32nd to 1-24th of a grain three times daily, dissolved in an acid) has been followed by marked improvement in the breathing powers, and a diminished tendency to the attacks of asthma. But if exhibited during attacks of spasmodic asthma, it seems rather to aggravate it than otherwise; and it is when these are over, and a state of exhaustion or atony follows, that this remedy proves beneficial. The same remark applies to the preparations of zinc, whether oxide, sulphate, or valerianate. In connection with this operation of strychnia we may bear in mind its power to prevent vomiting and restore tone to the stomach in cases of nervous exhaustion from abuse of stimulants, or from hysteria, in which I have often found it the most efficacious of all remedies. Whether in all these cases it acts directly on the affected tissues, or through the medium of the nerves, we are hardly yet in a position to determine. Arsenic is another remedy which seems to improve the breathing powers in some cases of emphysema, and to diminish the frequency of attacks of asthma; but it is slow in its operation in the doses in which it may be safely given (three or four drops of arsenical solution twice daily), and patients will not often persevere with it long enough to derive benefit from its use. I have found it peculiarly efficacious in the not uncommon cases of asthma complicated with psoriasis or eczema; but its beneficial influence is not limited to these.

Asthmatic subjects are extremely sensitive to atmospheric changes, and to all influences which affect the purity and other qualities of the air. A person afflicted with extensive and confirmed emphysema, especially that of the tense kind, may be thrown into a state of severe suffering by a change in the wind, by the coming on of a fog, by impurities in the air, or a rise in its temperature such as would not affect a person in health. It is only by avoiding all such deviations from the most salubrious standard that a patient thus affected can enjoy anything like ease and comfort, or indeed can hope to prolong life; and fortunate are those who can afford to migrate as the seasons change, and enjoy the pure air of a dry heath in the summer, and in the winter the equally pure but tempered air of the Nubian desert. Those who cannot afford to change their residence with the season should fix their abode in a sheltered spot, on as dry a soil, and in as pure an air, as they can find—in the summer much out of doors, strolling and basking in the sun; in winter, for the most part, shut up in well-ventilated, warm, but not overheated rooms. Such cases might be expected to derive much advantage from any means of increasing the oxygen in the air which they breathe, either by condensing the air by a forcing-pump in an air-tight room for the purpose, as has been practised at Montpellier, and other places in France, and at Ben Rhydding in Yorkshire, or by the occasional inhalation of oxygen gas more or less diluted with common air. I have known several instances in which these means have been tried by asthmatic and emphysematous patients, and some have experienced considerable relief for a time, but not of sufficient extent or permanency to induce them to persevere long in the measures, which have many inconveniences, and are not always unattended with risk. Recently, oxygenated drinks have been recommended with the object of supplementing through the stomach what the lung cannot receive; but it is very doubtful that either the so-called oxygen water or the diluted peroxide of hydrogen can introduce into the stomach a sufficient amount of oxygen to produce a perceptible effect in this way. But we have in nitric acid and chlorate of potass materials rich in oxygen, and readily parting with it, which may be given pretty freely without inconvenience. Twenty or thirty drops of the diluted acid with ten or fifteen grains of the chlorate in three or four tablespoonfuls of water may be taken three or four times daily. I have often prescribed this compound in cases of emphysema and other diseases in which the breathing powers were much impaired, and in some instances with apparent benefit. From some hospital trials formerly made, it would appear that neither the chlorate nor the nitric acid can be detected in the urine. Therefore the oxygen is retained somewhere in the system; but further experiments are required to determine this point.—*Medical Times and Gazette, June* 22, 1872, *p.* 705.

26.—ON CROUP.

By Dr. ROBERT C. R. JORDAN, Assistant Physician to the Children's Hospital, and Professor of Diseases of Children at Queen's College, Birmingham.

In all my own early teaching it was so strongly impressed upon me that "croup" was always a membranous exudation in the larynx or trachea, that it became to my mind a great difficulty to throw off the trammels of this old belief, and it was long before I could feel fully persuaded of what I now know to be the truth—namely, that the majority of the cases usually called by this name have no false membrane formed at all, but that their essential nature is an inflammation of the mucous membrane of the larynx and trachea, accompanied with secretion of tenacious mucus, and also considerable swelling caused by effusion into the submucous areolar tissue. They are, in fact, catarrhal inflammation of the larynx and trachea. All other cases where exudation is really present are diphtheria; and it is in this sense, and with this definition only, that we can regard croup and diphtheria as two distinct diseases. To make my meaning clear, let me follow out the course of the two, and lay before you in general terms the broad distinctions between them, beginning with the disease which in my younger years was most familiar to me, because during times of cold or east wind it occurs sporadically in country practice all over the kingdom, and to which I was taught to give the name of croup. The early symptoms are very similar to those of an approaching attack of measles, save that there is no superabundant secretion from the lachrymal glands, and consequently no running from the eyes and nose, but there is fever and dry barking cough of that peculiar character which of necessity occurs when the rima glottidis is narrowed. This cough is indeed the crucial symptom, and yet it has probably existed for two or three days before its nature has been marked enough to alarm the mother. On questioning her you are likely enough to find that the child "has had a cold for a few days, but that she has thought nothing of it." To trained ears, however, the peculiar cough is very manifest almost from the commencement, and if the child be asked to draw a deep breath the stridulous sound completes the diagnosis. The cough and the inspiration are both pathognomonic of croup, but of croup in its abstract sense only; they tell you that there is narrowing of the passage which allows the entrance and exit of air to the lungs—that is, of larynx or trachea. The history of the case supplies the other evidence. It is acute, and this eliminates all the chronic forms of laryngeal disease to which children are prone, such as, for example, warty or other growths. A careful examination shows no exudation on the throat or fauces, and the history is not that of sore throat, but of cough; this makes diphtheria at least improbable. The symptoms have been those which would naturally take place in an attack of bronchitis and tracheitis, with a tendency to spread still further upwards and involve the larynx in the mischief; and it is the swelling of its mucous membrane, and the consequent narrowing of the chink at the outlet of the larynx, and the swelling of the lining of the vocal cords, that gives the more decided "croupy" character to the cough, to the inspiration, and to the voice, this last being often almost absent. It is these also that give the danger to the attack; the same amount of congestion, the same amount of effusion into the sub-mucous areolar tissue elsewhere would be of no serious import. Hence the mother until closely questioned dates the attack from the commencement of the danger, and says that it came on "quite suddenly;" and in truth, when laryngeal symptoms do begin, they increase very rapidly, and every hour makes the danger greater—almost every breath is more and more difficult, respiration becomes more and more diaphragmatic, the sternum is drawn in with every breath, and in spite of the increased labour less and less air passes through the laryngeal opening; the lips and face become more purple, the lungs become congested, this further increases the dyspnœa, and the child dies suffocated. Such is the natural unchecked end of the disease—a termination which it is difficult to avoid in the cottages of the poor, where, from the very nature of the case, the child cannot get proper treatment, where there is no skilled nurse to follow out the doctor's advice, and where the temperature of the room varies with every opening door.

Now, what are the post-mortem appearances? There is no false membrane in either larynx or trachea, but simply a swollen and congested state of their mucous membrane, which is generally spread over with a tenacious mucus nearly as viscid as pneumonic sputa. These changes extend more or less into the bronchi, and with a congested condition of the lungs, are the only signs visible to account for death. I have many carefully noted records of such post-mortem appearances written in old days, when the influence of what Bacon would call the "idol of the theatre" was so strong upon me that it is always stated, "false membrane in a perfectly diffluent state spread over the mucous surface." Now, this "diffluent false membrane" is, in reality, only a synonym for tenacious mucus. This is the disease which occurs sporadically in town and country alike, and which is commonly called "croup." The cause is generally exposure to cold, though some children are more predisposed to it than others; and I have known many who have had several well-marked attacks, which for the most part decrease in violence as the child becomes older. It is also a decided fact that there is a clear predisposition to it in some families, though when a child is said to be "subject to croup" it is laryngismus that is most often meant. The essence of this disease is therefore laryngitis and tracheitis of a catarrhal character, and the danger is because the entrance and exit of air to and from the lungs is impeded; the object of treatment is therefore to make a decided and quick impression on the disease. Time does not admit of the least delay. You must at once place your patient in the best possible state for recovery—that is, let him be in a warm room with no drafts, and a uniform temperature of at least 70° Fahr., and let the air which he breathes be thoroughly saturated with moisture; a boiling kettle pouring out its steam into the room often manages this very efficiently. The plan which is adopted in the Children's Hospital here, is to boil a large iron kettle, to the spout of which is affixed a long tube ending in a rose like a watering-pot, from which the steam pours out copiously; but as this cannot always be at hand your ingenuity must be taxed to find a substitute—but remember that the soft moist vapour acting locally on the swollen mucous surface is as important an agent in the treatment as any other therapeutic means. A linseed poultice to the throat helps also in this, and has certainly a soothing power. These external appliances being completed, then give at once an emetic of ipecacuanha, and repeat this every twenty minutes or half-hour, until not only copious vomiting but copious perspiration is induced. As a result of this the secretion of the air-passages also becomes thinner and more easily got rid of, and it will be borne in mind that the cough becoming looser is an excellent symptom. Increased mucous râle, without the power of cough, has of course a different meaning, but a looser cough always bespeaks a lessened danger. In addition to the ipecacuanha, a very good prescription is a powder with calomel gr. ¼, compound ipecacuanha powder gr. ¼, and chlorate of potash gr. iij., every half-hour or hour according to the severity of the symptoms. Of course the dose must be modified slightly according to the age of the patient. If the disease does not abate, next comes the question of tracheotomy; and in this case I would leave it as long as can be done consistently with safety. So frequent is the recovery, even when the case is seemingly hopeless, that tracheotomy may be fairly called a last resort. These attacks of laryngeal catarrh can fortunately be pointed out as marked examples of the efficacy of medicine in acute disease. They are amongst the few cases where the effects of remedies can be seen, and where we can say that, if left to nature, the tendency is rather to death than to recovery. It is not meant to undervalue tracheotomy in these cases: no patient should be allowed to die without the chance which it affords. Yet so marked are the effects of curative agents, that time should always be allowed for a full and decided trial of their power before resorting to the operation.

The following case illustrates this catarrhal croup forcibly:—Early in the morning of August 14th, 1867, I was called to Arthur B., a little boy aged two years eleven months. I found him breathing a hundred times in the minute, the croupal sound very loud, the distress and agitation very great; the pulse could not be counted, the face was commencing to be dusky, the skin was hot dry, and burning. The operation of tracheotomy was proposed, but it was decided to try other means first. The room was therefore made warm with the steam of boiling water, the throat painted with liquor epispasticus, and a linseed poultice applied over it. A teaspoonful of ipecacuanha wine was ordered to be taken every twenty minutes, and half a grain of calomel every hour. A little before midday a slight improvement was noted, although there had been very frequent sickness, yet the pulse was stronger, the distress less, and the labour of breathing also lessened; but by the early evening the improvement was much more decided—the respirations were reduced to twenty-five, and though a loud croupal sound was audible with every respiration, yet there were moist râles also heard, and the skin was warm, damp, and freely perspiring. The pulse was only 90, and from this time the process of recovery went on steadily. It is seldom that a case presents such a decided improvement as this in so brief a time, yet the period of extreme danger is always short. To the treatment used I would now make one exception, viz., the blister. Had tracheotomy been necessary, as indeed at first seemed most probable, the blister would have complicated the operation, and rendered its after treatment more difficult. The linseed poultice alone seems to me, therefore, a safer remedy.

Now let us turn to the other form of disease. Where a false membrane is really present the whole category of symptoms is very different from those last described. This illness is not dangerous only from its position; it is not a mere catarrhal state of a mucous membrane, but it is a disease in itself, and the production of the false membrane is merely a phase in it. The patient, if he be old enough to complain at all, speaks of feeling ill, and of some soreness about the throat; but although there has been premonitory fever, there has not been, as in the last disease, premonitory cough. It is not, however, impossible that the croupal breathing, or croupal cough (for cough is then present) may be the first stage in the disease for which the mother requests the advice of her doctor, but the history will show that these have not been the first symptoms. On examining the throat, the uvula or tonsils are generally found more or less coated with the well-known diphtheritic membrane which has caused the "croup" by extending into the larynx. The history of this case shows that the child has been depressed and feverish for a time varying from a few hours to as many days, and that this has been followed at first by symptoms of sore throat rather than of cough. The last was a chest disease, proceeding upwards to the larynx; this is, as far as its external signs show, a throat disease passing downwards, and the difference in symptoms is to be looked for accordingly. All know that an elongated uvula does give cough; that a swollen epiglottis does the same; that the swelling of larynx would equally produce it, and that even before the invasion of a diphtheritic membrane; so that there may be a certain kind of cough history; but that has not been the special symptom—not, as in the cases of laryngitis before mentioned, the only symptom in a child otherwise well. Sometimes, however, the little patient is not seen until urgent laryngeal symptoms are well set in, and then, if there be no history, and also, from the urgency of suffocation, much difficulty in examining the throat, the diagnosis is one of real difficulty; but it is not then of vital importance, since in such a case the immediate performance of tracheotomy is certainly necessary. It is my decided opinion that sometimes cases of diphtheria occur in which no false membrane is visible from the mouth; yet it must be confessed that I have never made any notes with a view to the investigation of this special point, and there is some difficulty in getting a thorough look at the throat of a living child when suffering from laryngeal dyspnœa. Moreover, post-mortem examinations are apt to slur over the mouth, uvula, tonsils, and pharynx; yet I have notes of several cases where no throat diphtherite is mentioned, and where my firm impression is that none was present; and there certainly is no known reason why such should always be the case. There would, of course, be rather more difficulty in distinguishing these from catarrhal croup, yet this is in most cases rather an imaginary than a real difficulty. Albuminuria is a frequent symptom in diphtheria, but by no means constant enough to form a ground for diagnosis. If present in a doubtful case it might certainly clear it up; but, on the contrary, its absence would prove nothing. It is, therefore, the early symptoms, and the presence or absence of exudation in the throat, on which we mainly rely. If the child has had shivering and fever with sore throat before the laryngeal symptoms began, if there is a history even of general malaise before the croup commenced, we have a right to expect the presence of exudation, and when present it will most frequently be easily seen.

The next question which arises is, Do the two diseases require any difference in treatment so as to make a clear diagnosis of importance? Such is most decidedly the case. Catarrhal laryngitis is dangerous only from its position, and we have to subdue it by prompt and active measures; but in diphtheria we have a depressing blood-poison, dangerous in itself, quite independently of its position, and our lowering treatment is useless, or worse—positively injurious. Emetics are even to my mind doubtful. Cases are on record, certainly, where tubes of false membrane have been said to be brought up by their action, yet these must have been in a very different state from that in which we generally see them, as they do not usually adhere so loosely as to be got rid of in this manner, and we have no right to expect any such result. Still, one or two full emetics may be tried; but, these failing, do not steam the child as in laryngitis. Do not add to the depression by mercury, but give him some supporting mixture, such as the tinctura ferri muriatis with liquor ammoniæ acetatis; and if laryngeal symptoms have set in and there is real dyspnœa, if the breathing be laboured and the sternum drawn in with every breath, do not wait for symptoms of impending suffocation, but operate at once—the earlier the better. The false membrane in the larynx will probably spread further downwards; moreover, the blood-poisoning continues, and to wait for blue lips means to wait for pneumonia also. When the larynx or trachea is thoroughly invaded you cannot operate too early; delay means death. It must be remembered that the operation does not check the disease; but as we have no specific treatment that can stop it, perhaps simple support after the immediate risk of suffocation is over is as good as any other.—*Medical Times and Gazette, August* 31, 1872, *p.* 221.

27.—CHLORAL IN CROUP.

By Dr. John Barclay, Banff.

My first case was that of a child of fifteen months, who had first tonsillitis, then hoarseness, and croup supervening. During the three days after the larynx became involved the case went on like an unfavourable case of croup, from bad to worse, and at the end of that time little or no hope was entertained of recovery. Tracheotomy was proposed twice; the first time it was postponed because, just when the operation was about to be performed, some improvement took place; and then at a later period it was again proposed, but rejected as holding out next to no hope of saving the child. The distress of breathing was extreme, and more to relieve this than with any hope of ultimate benefit, I ordered two grains of chloral, with two minims of ipecacuanha wine every two, three, or four hours, according to the effect produced. Ipecacuanha wine alone had been given before. Besides these sherry was given freely. I watched the case carefully and closely all along, and these were the observations I made. Before the chloral was given the respirations were from 60 to 70 per minute, and the pulse varying from 144 to 156, and weak; the dyspnœa was extreme, and the voice and cough now close and dry. Within two hours after the first dose great relief in the breathing was observed, the child slept for half-an-hour at a time, the respirations and the pulse fell a little, and, what was more curious, a very copious exudation of mucus began in the larynx and trachea. Indeed, so great did this become that it was necessary to raise the child every half-hour, when a little water or sherry was given to produce a cough, by which the air-passages were cleared of the mucus. Had the child been allowed to lie it would soon have been suffocated, for after the chloral was given and the exudation had commenced, there was not the slightest inclination to cough. Gradually the pulse fell, and the respiration became slower, till at the end of twenty-four hours the former was only 108, and the latter 30. This treatment was persevered in for forty-eight hours, after which milk and sherry only were given. The recovery was slow but steady.

The next case was likewise one of inflammatory croup in a child of four years. There had been hoarseness and croupy cough for two days before I saw him. I ordered chloral in four-grain doses, with four minims of ipecacuanha wine, every four or six hours, and nothing else in the way of medicine. In two days the hoarseness and croupy cough had disappeared, the symptoms of improvement being the same as in the former case—namely, quiet sleep, exudation of mucus, and decrease of fever.

During the past two years I have treated several other severe cases of croup with the chloral and ipecacuanha, and I have not been disappointed at the result. In all of them I have made it my first object to obtain a quiet sleep, and on the child awaking I have almost always found some decided improvement.—*Lancet, September* 21, 1872, *p.* 404.

28.—ON THE TREATMENT OF HOOPING COUGH.

By Dr. William Maccall, Manchester.

In the management of a simple case of pertussis our first endeavours must be directed to the prevention of complications. The child should be sufficiently clad, and as far as possible guarded against exposure to variations of temperature, especially sudden variations. The food should be given in smaller quantities, and more frequently than usual; and should be of such a nature as (varying according to age) is most easily assimilable by the child. Where vomiting occurs so frequently as to interfere with nutrition, I am in the habit of ordering a small quantity of some light farinaceous food, or of beef-tea, to be given just after a paroxysm, as it is then most likely to be retained long enough on the stomach to allow of its being digested wholly or partly before vomiting again occurs. Complications occurring must be treated on general principles, with especial care to avoid depressing remedies, because we may still have the pertussis to deal with after the intercurrent malady has been subdued.

But after adopting these general precautions must we be content to remain expectant? In the mildest cases we *may* do so; but where the paroxysms are severe, and threaten to induce nervous or other dangers, we cannot simply stand by looking on; and fortunately we are not without remedies which have a marked influence in lessening the intensity and duration of the disease. In an affection which is so variable in these respects, statistics showing the length of time it lasted under different forms of treatment might be in the highest degree deceptive. We must be guided in our judgment, as to the comparative value of various medicines, by carefully watching the features of each case, and the apparent control which a remedy exercises over it, occasionally intermitting it as a further test. By pursuing this method in a large number of cases we can arrive at definite and useful conclusions, which would nevertheless lose rather than gain in clearness by being grouped statistically. I will therefore state very briefly the result of experience gained in this way.

Foremost among the remedies of this class I should decidedly place opium and belladonna. The former I have generally used in the form of Dover's powder, either alone or combined with camphor, about gr. j. thrice daily to a child of a year old. Its effect in lessening the number and intensity of the attacks is in many cases most marked, as well as in soothing the general irritability which often exists. Its tendency to produce constipation is sometimes objectionable, and where there is much moisture in the chest it is better not to use it.

Belladonna is the drug which seems to exercise the most constant and potent control over the paroxysms. I have generally used the powdered leaf, following the usage of the hospital—sometimes the solution of sulphate of atropia. As the tolerance of belladonna varies extremely, it is well to begin with small doses (*e.g.* gr. ¼ of the powdered leaf two or three times daily for a child a year old), and cautiously increase till we arrive at a dose which exercises an influence over the paroxysms. To effect this it is not necessary to produce decided atropism, and where this does occur it is well to reduce the dose or stop the remedy for a short time. I have found it equally effective, and more convenient in dispensary practice to give small repeated doses instead of the single dose once a day, or once in two days, recommended by Trousseau. As I have not pushed the remedy to heroic doses, I have not seen any alarming results from its use. In many cases, instead of constipating, it has a tendency to act gently on the bowels.

Bromide of Potassium was often used in these cases; but I have found it to be a much more uncertain remedy. In many cases its beneficial action is very marked, while in others it seems to be entirely ineffectual. It is specially valuable where a convulsive tendency exists. It has the advantage of not requiring much caution in administering; but sometimes it is not well borne by the stomach. To a child a year old about gr. ij. may be given three times daily, or oftener.

I have lately used *chloral*, and so far my experience of it has been favourable. It ought to be given in pretty full doses, (say a grain for each year of the child's age) and repeated every four hours. In severe cases it is often advisable to give it in such doses as will induce sleep each time. I have found it answer very well in some cases where convulsions occur.

Of some of the other remedies, such as hydrocyanic acid, sulphate of zinc, chloroform, topical applications, &c., I have not sufficient experience to speak definitely.

In cases where there is abundant secretion of mucus, especially in the later stages, I have found dilute nitric acid of much value. It seems to lessen the secretion and exercise an antispasmodic and tonic action. In continuing its use we must not forget its effects on the children's teeth. In cases where there is much prostration carbonate of ammonia is invaluable.

Emetics are useful adjuncts at all stages of the complaint, and in a few cases I have treated it by them alone. I have most frequently used powdered ipecacuan; in cases where there is much depression sulphate of copper is preferable.

Where the disease is protracted, and accompanied or followed by debility and emaciation, cod-liver oil (pure or etherised) is the most potent means we have for restoring health and preventing sequelæ, especially of a tubercular nature.—*Glasgow Medical Journal, Aug.*, 1872, *p.* 510.

29.—CONSUMPTION AND CONTAGION.

By Dr. Richard Payne Cotton, Senior Physician to the Hospital for Consumption, Brompton.

Numerous as have been the believers in the contagiousness of phthisis, no one had fully developed and openly advocated such a doctrine until Dr. William Budd published his startling, but clearly expressed and evidently well matured views upon the subject. In this paper Dr. Budd expressed his conviction that consumption is a zymotic disease of specific and highly contagious nature, closely allied in such respect to the most contagious diseases with which we are acquainted—viz., scarlatina, typhus, and syphilis, the tubercular material itself being the specific and morbid poison in which the malady originates, and by which it is disseminated through society.

Notwithstanding the high authority under which this view of phthisis is propounded, I most unhesitatingly declare my conviction of its fallacy. Consumption I believe to be a purely constitutional disease, which may be either inherited or acquired, but which, from its very nature, is incapable of being conveyed from one person to another in the ordinary sense of the word contagion. I have, indeed, never met with a case of pulmonary phthisis, however apparently due to a contagious origin, which could not be much more easily and rationally accounted for by generally recognised causes, than by the doctrine of specific and contagious influences. It is quite true that persons previously in fair health are sometimes seen to succumb to phthisis after having attended the last illness of some consumptive relative or friend;

but when it is remembered that anything which lowers the physical and nervous powers and depresses the general health is of itself sufficient either to originate phthisis or to develope some hitherto latent tendency to it, we have, I consider, a sufficient explanation of very many such cases, and might even wonder that they are not more frequently happening. In all instances of phthisis originating under such circumstances, it has long been my habit to make, as far as possible, a complete inquiry into their general, and more especially their family, histories; and I have invariably been led to the conclusion that the long nursing and the close connexion with the disease was at most the *exciting* cause of its subsequent development, the predisposing one having been, for the most part, sufficiently apparent, either in a previously-existing hereditary taint, or in some other cause far removed from the idea of contagion. If consumption were "caught" like a zymotic disease, how few in comparison must be the instances of escape to those of infection after contact with it; whilst it must be in the experience of us all that cases, arising even under the most suspicious circumstances as regards contagion, are by no means common, and bear a very small proportion to those in which, after the closest contact with the malady, no ill effects have resulted.

It must nevertheless be admitted that cases now and then occur in which consumption has become developed in the widowers or widows of those who have died of the disease, and under circumstances apparently favouring the doctrine of contagion. I have met with several such instances; but from notes taken at the time, I find the very curious fact that they have chiefly occurred amongst women. Such cases, however, do not, in my opinion, give the least support to the doctrine of contagion, but may be explained in a very different way. The union of husband and wife is not only a religious and social, but also a *physiological* one, as may be easily shown by our daily experience. It has often been remarked, for example, that after a variable period of married intercourse, the one person is seen to resemble the other not merely in manner and habit, but in feature and expression. The offspring, too, of second marriages has been frequently known to resemble both in feature and character the husband of the previous union. So well established, indeed, is this corresponding physiological fact with respect to the lower animals, that it has to be ever borne in mind in their breeding and rearing. If, therefore, certain natural and healthy peculiarities can be imparted from husband to wife, or *vice versâ*, there is every reason for concluding that morbid diseases, peculiarities, and tendencies may equally be imparted. But there is another and a less mystical way in which it may fairly be concluded that phthisis may be conveyed from husband to wife. A phthisical father may communicate to the *fœtus in utero* a comsumptive taint, which may thus be indirectly transmitted to the mother, just as we well know is often the case with secondary syphilis. And it may be due to this circumstance that, as I have already observed, phthisis arising under such apparently contagious conditions is much more frequently met with in women than in men. I believe, therefore, that in one or other of these ways—either by a transmission through the offspring, or by a mysterious and inexplicable connexion between husband and wife—phthisis may sometimes be developed in either of them; and we need not resort to zymotic influences in explanation of such an occurrence.

Upon the question of contagion, however, practical evidence is of far more value than anything speculative; and as a great experiment upon the zymotic character of phthisis has long been going on at the Consumption Hospital, I shall briefly give the results.

The Consumption Hospital was opened in the year 1846, with ninety beds. Ten years later, it was completed; and since that time, two hundred beds have been constantly occupied. We have lost, during this long period, only one nurse from phthisis; and this was a poor creature whose husband had deserted her, and who had long endured, from other causes also, considerable mental anxiety and physical exhaustion. On the other hand, the services of the nurses generally have been unusually prolonged; and I can myself testify to their general health being, as a rule, remarkably good. Of those *now resident*, two have been at duty in the hospital seventeen years; one has resided thirteen years; one, eleven years; two, ten years; two, nine years; one, seven years; one, four years; two, three years; and four, two years. The two oldest nurses have lately died of old age and general decay, after having long been superannuated; each of these had resided in the hospital for upwards of twenty years.

The present chaplain has been with us for twenty-two years; and his two predecessors are still living. Happily all of them are well.

Of the staff of physicians and assistant-physicians—nineteen in number—one only has been affected with phthisis; and he was a young man of delicate and decidedly consumptive aspect. The period of office which some of us have had is unusually long. Of the present physicians, two have been upon the staff twenty-four years each; one, for seventeen years; one, for thirteen years; one, for nine years; and one, for five years. The late senior physician, who resigned only three years ago, had been attached to the hospital, and in constant work there, from its very foundation. Two of the former physicians who resigned their appointments, and subsequently died of disease quite distinct from phthisis, had held office in the hospital for fifteen and nineteen years respectively.

With the above facts before us, must it not appear to all believers in the doctrine of phthisis originating in a special and contagious poison, that a residence in the Consumption Hospital, and long-continued working in its wards, is a very good way indeed *not to catch the disease?—British Medical Journal, Aug.* 31, 1872, *p.* 239.

30.—A REMEDY FOR CATARRH.

Dr. E. **Brand** (*Berlin Klin. Wochenschrift*) speaks in terms of recommendation of the following formula for an anticatarrhal olfactory, prescribed by Dr. Hagner: ℞ Carbolic acid, 5 parts; rectified spirit of wine, 15 parts; strong solution of ammonia, 5 parts; distilled water, 10 parts. The mixture is kept in a stoppered dark glass bottle. When a catarrh is commencing, a few drops are placed on three or four layers of blotting or filtering paper; the patient, holding this in his hand, and closing his eyes, inhales deeply from it as long as any smell is perceptible. The effect of the treatment is to cut short the acute stage of the cold, to prevent the occurrence of subsequent coryza and bronchial and laryngeal catarrh; while all troublesome symptoms are rendered much milder. The remedy should be applied every two hours.—*British Medical Journal, July* 6, 1872, *p.* 12.

DISEASES OF THE URINARY ORGANS.

31.—IMPROVED METHOD FOR THE MICROSCOPIC EXAMINATION OF URINE, &c.

Whatever can diminish his labour and save his time must be welcome to the busy practitioner. The ordinary method of examining urinary deposits microscopically entails a considerable expenditure of both; and the process has generally to be repeated several times in order to discover all the characters of the deposit. By the use of the simple contrivance of a "submersion tube," first described by Dr. Dudgeon, in Vol. xi. of the *Quarterly Journal of Microscopical Science*, this labour is greatly diminished, and a large quantity of the urine can at the same time be examined at one operation. The submersion tube is simply a brass tube closed at the end by a thin plate of glass, which is screwed on to the objective, so that the latter may be dipped into the fluid under examination, which is contained in a glass tank or trough placed upon the stage of the microscope. The urinary deposit is, in most cases, quickly thrown down upon the bottom of the trough, and thus the examination of a large quantity of urinary deposit is at one time made quite practicable. The advantage of such a plan as this will be apparent in many cases; as, for example, in the urine of patients suffering from contracted granular kidney, with few renal casts.

The only points to be attended to in the construction of the submersion tube are, that the length the tube projects beyond the object-glass shall be less than the focal distance of the latter, and that the thin glass plate shall be cemented to the brass tube in a perfectly water-tight manner. As the fluid in the trough must be kept horizontal, the microscope of the ordinary construction must, of course, be used perpendicularly, so that if we wish to be seated while making our examination, the microscope should commonly stand on a low table, or a common wooden chair. Objectives of various powers, fitted with a submersion tube, are very useful for examining minute aquatic, vegetable, and animal organisms in a considerable quantity of fluid. They are especially adapted for watching the development of the ova of fishes, amphibia, and molluscs, for examining the circulation in the transparent membranes of fishes, and for all other purposes when it is necessary that the object under examination should be immersed in a considerable quantity of fluid. The examination of vomited matters, neglected as a rule by practitioners, will be, in some instances, also greatly facilitated by Dr. Dudgeon's submersion tube.

Mr. Adie, of Pall Mall, or any other optician can make a submersion tube to fit on to an objective of any power up to a quarter of an inch, and perhaps even to objectives of higher powers, though, for ordinary purposes, it is not necessary to go beyond the quarter-inch objective. It is scarcely necessary to remove the submersion tube when examining objects in the ordinary way between two plates of glass, for the thin glass plate that closes the end of the tube does not appreciably affect the distinctness of definition of the object seen through it. The glass trough should be made of pieces of plate glass cemented together with marine glue. For examining urine it need not be more than two inches square and one inch deep. We are of opinion, from a careful trial with the submersion tube, that its advantages are such as to encourage and simplify the use of the microscope in the wards and in private practice.—*British Medical Journal, March* 23, 1872, *p.* 314.

32.—CASES ILLUSTRATING THE ACTION OF CONTINUOUS ELECTRIC CURRENTS ON SPASMS OF THE BLADDER, URETHRA, AND URETERS.

By Dr. Reliquet, of Paris.

I.—In the month of March, 1869, I had a patient suffering from stone in the bladder, with contraction of the bladder over the stone. Micturition took place almost every instant, and it was quite impossible to inject more than ten grammes of tepid water into the bladder.

I resolved to make use of electricity, and, with my friend Dr. Onimus, applied continuous electric currents in the following way. A gum-elastic sound, furnished with a very flexible stilet, was introduced into the bladder; the usual ten grammes of water were injected, and the sound closed. The positive electrode was then applied to the stilet, and the negative (a large moist plate) to the hypogastrium. At the beginning of the current there was a little pain, which soon disappeared, and then complete composure ensued. After four minutes the currents were stopped; then tepid water was injected into the bladder, and as much as 150 grammes were introduced without the patient feeling the desire to make water. I availed myself of the opportunity to examine the stone, which I found lodged in the vesical fundus, where it was impossible to lay hold of it with the lithotrite. The painful spasms having returned under the provocation of these exploring manœuvres, I resumed the continuous currents, which immediately brought back the calm which they had at first produced.

This brusque dilatation of the bladder occasioned the unloosening from the vesical parietes of crystalline incrustations, which the patient passed during the forty-eight hours which followed this first application of electricity.

On the following days I renewed the application of electricity, and each time I invariably obtained the same temporary sedation of the vesical contraction. However, after the first micturition which followed, the spasmodic condition of the bladder again returned.

In this case the problem so eagerly sought to be obtained by the most various means, and especially by the local action of carbonic acid—namely, *to dilate the contracted bladder*—seems to have been solved.

Consecutive applications of continuous electric currents in various cases of painful spasms of the urinary passages, have determined in a definitive manner the practical importance of this novel remedy.

II.—In the month of October, 1871, I again applied continuous electric currents to act against the contraction of the bladder over a calculus. The results which I obtained were absolutely identical with those of my first case. Only thirty grammes of tepid water could be tolerated by the bladder: by means of the current I was enabled to inject 130 grammes without bringing on any desire to pass water. But, as in the former instance, the desire to pass urine became more and more frequent after the first micturitions which followed, and the condition of contraction did not fail to return: the direct cause of the phenomenon, namely the stone in the bladder, being still present.

III.—In the month of January, 1870, I attended a young man of twenty-one, who came to consult me, he said, for catarrh of the bladder. And, indeed, the urine contained much muco-pus. Moreover, the desire to pass water was most frequent. The jerking jet of water at the commencement of micturition did not persist; at the end the urine passed in drops. There was constant pain in the anus, and pricking sensations in the neighbourhood of the glans. Pain was especially intense after each micturition. On examining the bladder, I found that it did not empty itself at each micturition, though it could not bear more than 100 grammes of tepid water. Yet I could find no calculus. After this investigation, which had been carried on with the slightly curved instruments, the patient was two days without feeling any pain in the anus or penis. They again appeared, however, after that time, and renewed depression of the lower lip of the neck of the bladder produced no effect.

I then applied the continuous electric currents. As in this case it was contraction of the urethra which dominated, the bladder not emptying itself entirely, I applied the negative electrode in the bladder, and the positive electrode over the hypogastrium. After having thus made several intermittances, I allowed the continuous current to go on. Then putting the positive electrode on the perinæum, I obtained a current crossing the deep region of the urethra, and going from the perinæum to the bladder. After five such applications the desire to make water was only felt three times in twelve hours; the bladder could receive 220 grammes of tepid water without there being any wish to urinate, and furthermore could effectually empty itself. Pain had completely disappeared; motions, which had been difficult, had now become easy, natural and daily. The urine contained scarcely any muco-pus.

Walking, and especially dampness of weather, however, had the effect of awakening the condition of pain. But new applications of the continuous electric currents arrested the painful spasms, and again caused disorders of micturition to disappear.

At the end of February, the patient, on returning one night from the theatre, was seized with a violent nephritic colic of the right side. At the same time the urine was very thick, and micturition became quite frequent. I immediately had recourse to the continuous currents, applying the positive electrode to the back in the situation of the right kidney, and the negative electrode over the perinæum. I made a long *séance* of a quarter of an hour. After this the night was passed in complete calm, and the patient passed in making water, almost without being aware of it, a tolerably large quantity of gravel. On the following days I continued the employment of the electric currents, still following the direction from the left kidney to the bladder. Complete recovery became more and more evident. Ten days after the escape of the gravel, I carefully examined the bladder with the exploring lithotrite, but discovered nothing. The bladder could then tolerate 220 grammes of tepid water, and micturition took place regularly every three or four hours. The urine was quite normal.

It seems obvious from this fact that (1) continuous electric currents first cause the arrest of spasmodic phenomena of the urethra and bladder excited by renal gravel and by the alteration of urine which results therefrom; and (2), a most important fact, that the action of electricity has been most effective against the spasms of the right ureter, since, by occasioning the cessation of the spasms, it excited the evacuation of the renal gravel.

In the following case, which I have briefly summed up, it will be seen that, in a very irritable subject, electricity, in causing the disappearance of the spasms of the urethra, also caused the permanent disappearance of disorders of micturition.

IV.—In the month of August, 1871, Mr. H., aged forty-five, of an extensively developed neuropathic temperament, came to consult me. He had just returned from Contrexeville, whither he had resorted with the hope of getting rid of various urinary troubles from which he had been suffering for several months.

On examining him I remarked the presence of the following symptoms:—Frequent desire to urinate: nine or ten micturitions in the night; not quite so many during the day. There is a thick sediment of muco-pus in the water, but no crystals or earthy matter. Moreover, the urine has no smell of ammonia. Each micturition is accompanied with an intense burning sensation in the urethra, and followed by a painful sensation going from the anus to the meatus urinarius. There is habitual constipation.

This constipation I immediately attacked by prescribing a glassful of Pullna water every two or three days, and the use of fresh vegetables.

On August 29th, I introduced easily into the urethra a gum elastic sound of five millimetres in diameter. Its passage through the deep region of the urethra excited intense pain. By means of the sound I drew from the bladder more than 200 grammes of urine, a much greater quantity than that afforded by each micturition, and which proved that the bladder did not entirely empty itself at each micturition. After having injected tepid water into the bladder, I attempted to introduce the exploring curved catheter; but as soon as the beak of the instrument attained the membranous portion, intense pain ensued, and consequently contraction of the urethra, which completely put a stop to any further introduction. I therefore contented myself with passing a metallic sound, with a less marked curve, by the aid of which I explore bladders in which I have discovered nothing.

After this exploration the pain in making water became much more intense, and micturition still more frequent.

The following day, August 30th, I applied continuous currents, putting the positive electrode in the bladder, by means of a curved sound furnished with a brass wire (moving freely within the sound), and the negative electrode over the perinæum.

After five minutes' employment of a perfectly continuous current, I applied the negative electrode to the hypogastrium, where I made various interruptions of currents. In this way I made four *séances* of electricity, one every day; and then four others, one every two days; making in all eight sittings.

From the very first sitting, the pain in making water became much less intense. As pain diminished, so the quantity of urine afforded by each micturition became greater, and the desire to make water more and more rare. After the sixth *séance* there were only two micturitions in the night, and during the day the patient remained more than three hours without any wish to urinate.

The water gradually became normal as the disorders of micturition disappeared. I may just state that the patient was taking an infusion of pine-buds.

Two months later, at the end of October, I saw Mr. H., and he was still doing remarkably well.

As is shown by this case, the spasms of the urethra cease and the complete contractility of the bladder disappears, under the influence of continuous electric currents properly applied.

In cases of spasms of the deeper portion of the urethra due to chronic urethritis of this part of the canal, I have always obtained the abatement of the spasms, and consequently a diminution of functional troubles. The patients make water less often; the water does not run out by jerks, and the comparatively considerable effort made to eject the urine, which is so slow in issuing, decreases much, and often is reduced to the normal effort which attends the beginning of micturition. But in these cases, when we do not succeed in dispelling suppuration of this deep portion of the urethra, all the spasmodic phenomena return as soon as the applications of electricity are suspended.

This abatement of functional troubles procured by the continuous currents is a most favourable condition, which increases the efficacy and play of the therapeutical means employed in chronic urethritis.

When, whatever may be the cause of functional troubles of micturition, the patient is an irritable subject, there is need at each *séance* to begin by electrising the lower part of the spinal cord with a descending current: the reflex power is thus diminished. It is by this means that Dr. Onimus has been enabled to cure nocturnal incontinence of water in several children; but with these patients it is important not to act directly upon the genital parts.

We are now in possession of a means of action against painful spasmodic phenomena of the urethra, of the bladder, and of the ureters, and, what is very important, of a remedy which produces no inconvenience in the general organism, as have done all the medicinal substances employed until now, as, for instance, opium, belladonna, and bromide of potassium. Moreover, as all the facts of my experience have shown me, the action of continuous currents is immediate. We are able to calm instantaneously pain produced by the contraction of the bladder over a calculus, and that until the bladder again becomes irritated over the stone. And, during this time of temporary dilatation of the bladder, of vesical tolerance, we are enabled to act on this stone. Whence arises a most important indication amidst many others, namely, the possible advisability of applying continuous electric currents immediately before a *séance* of lithotrity. —*Practitioner*, *Aug.*, 1872, *p.* 98.

33.—ON A METHOD OF DETECTING SMALL QUANTITIES OF SUGAR IN URINE.

By Dr. J. Seegen, Professor in the University of Vienna.

Trommer's is the most reliable and delicate test for sugar. With its aid, I am able with certainty to make out 0·3 *milligramme* (0·0046 grain) of sugar dissolved in 10,000 times the amount of fluid. This great delicacy of the test, however, only holds good as long as we have to do with a watery solution of sugar. If, on the contrary, small quantities of sugar are to be detected in urine, Trommer's test is neither delicate enough nor reliable, for two reasons. 1. Urine contains certain substances (colouring matters, creatine) which prevent the suboxide of copper when formed from being precipitated; no separation of the reduced suboxide of copper, therefore, takes place, the blue fluid only becoming yellow or yellowish-brown or presenting a turbid discoloration. 2. The same processes of reduction are also brought about by uric acid; and urine, containing a considerable amount of uric acid, acts on Fehling's test-fluid exactly in the same manner as urine containing 0·1 to 0·2 per cent. of sugar.

The method devised by me has for its object the exclusion of those other constituents of urine which would disturb the proper action of the test, and the transformation, as it were, of the saccharine urine into a watery solution of sugar. Animal charcoal has the property of retaining most of the constituents of urine, more especially the colouring matters and uric acid. After filtering a watery solution of uric acid through animal charcoal I could (provided the charcoal had been good), after repeated filtrations, not find a trace of uric acid in the filtered fluid. Now, in order to detect small quantities of sugar in urine, I proceed in the following manner.

I filter one or two ounces of the urine several times through good animal charcoal until the urine is completely colourless. This operation only takes a few minutes. Then I wash the charcoal on the filter with a little distilled water, and to this water, when filtered off, I apply Trommer's test. The water with which the charcoal has been washed is almost as sensitive to Trommer's test as a watery solution of sugar, and in it I could detect even 0·01 per cent. of sugar by a beautiful red precipitate of suboxide of copper, whilst the original saccharine urine, when not filtered, only produces a yellow discoloration of Fehling's test-fluid. With urine containing a little more sugar—say 0·1 to 0·2 per cent.—the water flowing off from the second and third washing acts even more energetically upon the test-fluid than that of the first washing, producing an even purer deposit of suboxide of copper. The water obtained by the subsequent washings thus evidently contains the sugar in a purer form. With normal urine, the water obtained by the above process is either entirely inactive towards Fehling's test-fluid, which remains blue, or it assumes only after a while a slight dichroid (varying colour according as the light falls on or passes through) turbidity. The water obtained by a second or third washing always remains without any effect. When the quantity of sugar has to be determined, the urine must not be filtered through charcoal, as the latter always retains a certain quantity of the sugar which cannot be removed again by washing.—*British Medical Journal, May* 4, 1872, *p*. 469.

SURGERY.

FRACTURES, DISLOCATIONS, AND DISEASES OF BONES, JOINTS, &c.

34.—PLASTIC APPARATUS IN SURGERY, WITH ESPECIAL REFERENCE TO THAT VARIETY MADE WITH PLASTER OF PARIS.

By Dr. SAMUEL B. ST. JOHN, New York.

I boldly assert my belief that no other apparatus is so successful for treatment of fractures generally as the so-called immovable apparatus, and no other variety of that apparatus so good as that made with plaster of Paris or gypsum. This assertion compromises me to the utmost, for it is the expression of a conviction founded upon extensive observation and personal experience, and sustained by theories, some of which are original, so far as my knowledge goes.

Regarding materials, we may say that leather, felt, paste-board, and gutta percha—all of which may be softened in water—have always borne a high reputation. Liquid applications, to be applied with a brush or the hand upon a substratum of cloth, such as solutions of starch, glue, dextrine, or water-glass, have given a very brilliant series of results, and under this head may be classed that variety of the plaster of Paris splint made by soaking thick cloths in a plaster "cream" (made by mixing gypsum with water to the consistency of ordinary cream). The latest modification of this type of apparatus is made by using the dry plaster incorporated with the meshes of an ordinary bandage, as will be described subsequently.

With regard to the method of application of plastic apparatus generally, we may remark that the earliest were made in a very clumsy manner by placing the limb in a box and pouring the plastic material around it, or by smearing it over the outside of the limb, as was done in those alluded to as being made of clay or mortar. The first advance was in wrapping the limb in some fabric, such as cloth or matting, which was smeared upon the outside. These methods secured a strong splint, it is true, if made thick enough, but exceedingly heavy and difficult to remove. A great improvement was made by soaking the cloths in the plastic material, made temporarily liquid by some menstruum—usually water. It was then found that equally strong splints could thus be made, which were much thinner and lighter than before, and the advantage thus gained by a combination of the fibre of the cloth with the resisting material led to a more intimate and uniform combination by making the splint out of roller bandage, saturated with the liquid starch, dextrine, or gypsum. An improvement, in my opinion, though not an essential modification, is the use of the roller bandage having the plastic material rubbed in dry, as will be explained hereafter.

The plaster bandage of Mathiesen has lately received a thorough trial at Bellevue Hospital, and with the most gratifying results. It combines the firmness and solidity of the plaster with the tenacity of the cotton fibre, thus securing a firm and tough splint with a minimum of plaster, and, by consequence, a minimum of weight, with the additional advantage of application in a form which enables the surgeon to secure the most accurate adaptation to the limb under treatment. The plaster bandage is prepared by rubbing the fine, dry plaster into the meshes of a cotton or flannel bandage, the coarser the texture the better (within limits), as it holds more plaster. I have used also bandages of canton-flannel, and coarse linen (towelling). The linen ones made the toughest and lightest splint, and ordinary flannel next best. Lately tulle has been used, and it is highly spoken of as making a lighter splint than any other material, but it is too weak to be snugly applied. Tarletan was the material used extensively by the Germans in the late Franco-German war, and they strengthened their splints by their wooden ribbons, pieces of which were worked in longitudinally. A fine film of plaster is then dusted over it and the bandage rolled up rather loosely. These bandages may be kept ready for use in tin cans with tightly-fitting covers, or each bandage may be separately rolled up in tin-foil. In making a splint for a fractured leg, for example, the leg is first enveloped in a layer of cotton wadding, or, what I prefer, a single thickness of soft blanket. If cotton is used it is best to hold it in place by a roller bandage, loosely applied over it. Burggraeve preferred to use a layer of cotton one and a half inches thick, and no dry bandage, which he claimed was so elastic that it followed the diminishing leg as swelling subsided. The blanket will need no bandage, but may be secured by a few stitches at intervals. The plaster bandages are then immersed in a basin of hot water to which about ℥ ij of common salt have been added (the high temperature and the salt both contributing to the rapid setting of the plaster). In about three minutes they will be saturated, and are ready to be applied. Extension then being made upon the foot, and the bones adjusted, the plaster bandage is taken from the basin, squeezed firmly to get rid of the superfluous water, and applied after the fashion of an ordinary roller, from the base of the toes up to or beyond the knee, each successive turn being drawn snugly to its place, but not too tightly, especially if the bandages have never been washed, as they will in that event shrink a little in drying. Experiments show that the plaster in setting does not contract at all, so that there is no danger of ligation from that source. Three, or at most four, bandages should make a firm splint from the toes to the knee. In applying the roller, should the plaster, which it holds, seem to dry, the hand may be dipped in the basin and rubbed over the dry surface, and indeed it contributes to the firmness and elegance of the splint to keep the hand constantly passing over the successive turns of the bandage, rubbing in the plaster and smoothing the surface. An elegant finish and, at the same time, some additional strength may be given by mixing ℥ ij of the plaster with so much water and smearing it smoothly over the surface. It is best not to apply a dry roller outside, until the splint hardens enough to hold the parts in position, as it retards the setting by preventing evaporation, but the limb should be carefully held by the surgeon for a few minutes, and then placed upon a rubber blanket until it becomes quite dry and hard, when a dry bandage may be applied, if desired, though it is not at all necessary.

Thus far, the application in an average case of simple fracture has been considered. Several details, which will at once enter the mind of the surgeon, must now be considered. First, How soon may the splint be applied? Let us see what was the practice of our predecessors. Larrey, as a rule, applied it immediately, except where there was any considerable swelling, or where the muscular contractions were increased by the unavoidable handling of the limb. Velpeau says, "apply at once in all cases where there is not swelling, or where the soft parts are healthy, for swelling after fracture comes too soon for inflammation, and is mainly from extravasated blood, and an early reduction and complete retention of the fragments in place will prevent irritation, the initial step of inflammation, and prevent additional rupture of bloodvessels." Scutin (*op. cit.*) applied it at once, believing that it acted to prevent inflammation in still another way, the uniform compression of the bandage (according to his view) restricting the arterial, while it favoured the venous circulation. In a late article Volkmann advocates immediate application, arguing that it tends to restrain traumatic reaction. For my own part, I believe that an intelligent surgeon, who can see his patient every day, and who employs the precautions alluded to, need not hesitate to apply the splint as soon as the patient comes into his hands. I speak advisedly in this, having repeatedly applied it while the patient was suffering from the shock of the accident, in injuries ranging from simple fracture of the fibula up to compound fracture of the femur, and in no case have I had occasion to regret doing so, but in all the cases the fixation of the irritating fragments has seemed to act as a prophylactic against swelling and general nervous irritation. In average simple fractures 'constitutional symptoms" were almost unknown. These statements are supported by the cases given tabularly, where in eighty cases of simple fracture this splint was applied within twenty-four hours from the time of the injury, in many of them within two or three hours, and the fact that fourteen of these were from direct violence shows that cases were not selected which were less apt to be complicated by swelling. In twenty-six other cases the splint was put on within forty-eight hours, three being the result of direct violence.

Secondly. In what cases should cotton wadding be used as a lining, and in what cases blanket? A year ago I employed cotton where, from the contusion of the soft parts, great swelling might be anticipated; since I regarded it as a more elastic medium. At present I use blanket in every case, because it is more evenly distributed over the surface of the limb, and thus by giving more even support tends to prevent swelling, and also because by making an early section of the plaster casing it can be loosened a little should necessity arise.

Perhaps, this reference to section of the apparatus will afford the most natural approach to an explanation of the manner in which it may be done, without hurting the patient or injuring the splint. This section may be most easily made about two hours after the application of the splint, as it then cuts like hard cheese. If, however, the section is delayed until the splint has become dry and hard, it may be softened in the track of the proposed section, by boiling water applied with a sponge for a few minutes. (Nitric acid is used by some for this same purpose, but it ruins the knife, sometimes goes through and blisters the skin, and does not make the section any easier.) A common shoemaker's knife, *kept sharp*, is the best instrument to use in opening the splint, and the risk of cutting the patient may be reduced to a minimum by making two sections an inch apart, one on either side of the median line nearly through the plaster, and then raising the intervening piece at the top and completing the section by alternate nicks on either side. By thus removing a strip one inch wide a firm hold may be secured of the cut edge of the splint so as to spring it open to inspect the limb, and it also affords an opportunity of tightening the apparatus, should it have become loose by subsidence of swelling. Should the swelling, however, have gone down so much as that it is necessary to remove a strip more than an inch wide in order to make it hug the limb, it will be better to remove the splint and make a new one, otherwise the tendency will be to roll the bones in toward the median line of the limb, in the case of the leg or forearm especially. I have tried various kinds of cutting pliers, Henry's, Seutin's, &c., and saws, also, but found none so serviceable as the knife. An instrument made by Leiter, of Vienna, a gentleman thoroughly versed in the management of gypsum apparatus, assures me leaves nothing to be desired in this direction. Its mechanism is such that a tremendous leverage is obtained, so that when the lower blade is slipped between the splint and skin, the upper one cuts down upon it through the splint. The instrument has just been introduced into this country, and promises well, but I desire nothing better than a sharp knife.

In compound fractures the method of its application varies. If the opening through the soft parts is not large, and there is not much contusion or laceration, an apparatus like that for simple fracture may be applied, and a fenestra cut, through which to dress the wound. It must be made heavier and stronger than if the fracture were simple, but as the patient is to remain in bed with the limb supported for several days, if not weeks, this is not a disadvantage. In several such cases I found that five bandages were usually needed, and the splint was, in all cases of fracture of the leg, extended above the knee. The fenestra should be cut in accordance with the principles given in describing the longitudinal section of a splint for simple fracture. Some make a practice of leaving the piece covering the wound attached by one side like a trap-door, but in my opinion it is neater to remove it entirely, as it enables the surgeon to trim the edges of the trap all around in a uniform manner, and, moreover, the trap-door is apt to be in the way when the wound is being dressed. This method of procedure is, however, applicable only when the trap is to be of moderate size, of a breadth, perhaps, one-fourth of the circumference of the limb. The *length* of the trap is nearly immaterial, as it does not materially diminish the supporting power of the splint. When, from any cause, such as the extent of the external wound, or the suspicious look of the soft parts (and this applies equally to simple fractures with great contusion), it becomes necessary to have a large surface accessible to inspection without disturbing the fragments—a combination of the plaster bandage with blanket soaked in gypsum "cream" is to be used—and it was this combination, under the name of the "interrupted splint," which, during the past year, secured such brilliant and gratifying results at Bellevue Hospital in the treatment of bad compound fractures.

To apply this, the limb must be thoroughly inspected to find out what parts are least contused and least liable to become the seat of local trouble. It is only necessary to find a strip of sound tissue about two inches wide connecting the limb below the fracture with that above. If that can be found on the anterior surface of the leg or arm so much the better, as the connecting band between the two parts of the splint will then be out of danger of being soiled by discharges, or of being wet when the wound is syringed out. A piece of ordinary blanket is then to be cut, about eight inches wide, and long enough to extend well above and below the joints on either side of the fracture. (In fracture of the leg it is usual to have this reach from the toes to the middle of the thigh.) The limb having been previously encased in blanket, as described for simple fracture, a plaster "cream" should be made, and the blanket previously cut out immersed therein—or, which is preferable, the blanket may be laid upon a table, and the mixture thoroughly rubbed in with the hand. It should then be folded upon itself twice so as to make a strip two inches wide, and laid along the part of the limb previously determined on. A plaster bandage should then be applied in the ordinary way below the point of fracture, binding the limb to the connecting piece and extending to as near the point of fracture as it is deemed safe to allow the limb to be concealed from view. Up to this point the limb has been supported by the hands of assistants, but no attempt made to reduce the fracture thoroughly. Now, the lower half of the apparatus being completed, an assistant, grasping it, makes strong extension (if necessary) and the bones are accurately adjusted. The upper end of the connecting band is then to be fastened to the limb above the fracture by turns of a plaster bandage. Thus an apparatus is made, fitting the limb accurately above and below the seat of injury, and having its two parts connected by a stiff bridge two inches wide—or, in other words, it is a plaster splint with an immense fenestra. In such an one which I made for a hopeless case of compound fracture of the leg, where the man refused amputation at first, the leg could be exposed from about three inches above the ankle-joint to two inches below the knee-joint, and the apposition of the bones, which could be distinctly seen at the bottom of the wound, was perfectly maintained until the amputation two weeks later. In this case, owing to the oblique course of the crushing force (car-wheel), the only sound skin lay in a spiral line which I followed with the connecting band. If the connecting band is of necessity placed upon the depending side, it is of advantage to keep it away from the limb just opposite the wound by means of a thin blanket pad placed under it; this pad to be removed after the splint has hardened, leaving a space through which a strip of oiled silk may be passed for the protection of the splint—the remainder of the space to be stuffed with cotton or other material easily changed when soiled. Indeed, the trap should be edged all round with oiled silk tucked under the edges, and cotton should be placed between the oiled silk and the skin to prevent the discharges from passing under the splint.

Another way which is very elegant, and which is of use in cases where the wound is not very large, is to cut, in a large piece of oiled silk, a hole a little larger than the wound, and then to fasten the edges of the hole to the skin around the wound by means of collodion. This collodion, being insoluble in the discharges, keeps the oiled silk so closely applied that the discharges are forced to find their way out through the hole in the silk, where they are received into a compress of oakum bound on. It will sometimes be found useful to paint the splint with a solution of gum shellac in alcohol (℥j to Oj) which gives it a water-proof finish. This, however, has two disadvantages; it prevents the transudation of perspiration, and it renders it somewhat difficult to enlarge the trap, should that be necessary, since it gives the surface a glazing which is extremely hard in itself, and prevents the use of water to soften the splint in the track of the proposed section. In case the connecting band is found to be too weak, it may be at any time strengthened by additional strips of soaked blanket laid along it, and secured above and below by turns of plaster bandage. In some cases where the connecting bridge was of necessity so narrow that I feared it would be too weak, I inclosed a stout piece of hoop-iron between the folds of the soaked blanket, the iron reaching about three inches above and below the proposed trap, the ends being embedded in the more solid parts of the splint. This is also a useful plan to adopt when there is reason to fear that the trap might have to be enlarged and more strain brought to bear, consequently, upon the connecting band.

Special Fractures.—Fracture of the Femur.—Perhaps in no other fractures have the merits of the gypsum apparatus been so conspicuous as in those of the femur; "it having triumphed here, not only by the brilliancy of the results, but by the comfort afforded the patient during convalescence." A simple fracture of the femur treated with any other form of apparatus compels confinement to bed for six weeks on the average, with the consequent lowering of vital status, discomfort to the patient, and trouble to friends and attendants; while with this the patient may be out of bed upon crutches the second or third day after the fracture, and is as comfortable and nearly as well able to wait upon himself during his whole convalescence as is a man with simple fracture of the tibia in the fourth week of treatment under the old regime. And the results as regards shortening, time and strength of union, and subsequent usefulness of the limb, surpass statistically those of any other method of treatment, as a glance at the cases given further on will show. In the words of a surgeon whose name is identified with a different plan of treatment, "the statistics thus far are better than those of any other method," and the refusal of a prominent teacher to recommend this method is founded, as he himself acknowledged to me, on the belief that special experience is required to apply it properly rather than in any distrust of the method itself.

A description of the method of application is essential to the completeness of this paper, and I give it rather with that view than with the design of improving upon the admirable paper of my friend, Dr. Bryant.

A table must be obtained and an upright bar about one inch in diameter secured to the middle of one end, so as to rise about two feet above the top of the table. In Bellevue Hospital an iron bar is kept which fastens on by clamps, but in private practice I have used, with entire satisfaction, a wooden bar one and a half inch in diameter, put through a hole bored in the end of a common kitchen table, and lashed to the braces below. This upright should be thinly padded and covered evenly with a roller bandage. If the padding is too thick it will be in the way; if too thin, the bar may excoriate or cause undue pressure. The patient is to be placed upon the table with the nates well down towards the edge, and the upright projecting between the thighs, so that the perineum rests lightly against it. My practice has been to place another table in line with the first and abutting against it, to support the legs of the patient, and to afford a point from which to make extension. The provision for extension may be made in one of two ways, by traction upon a so-called Buck's extension apparatus, of adhesive plaster, which should be made with a very strong but narrow loop from malleolus to malleolus, so as to be in the way as little as possible, or, which is preferable, by a clove hitch around a stout plaster splint put on the day previous from the toes to the knee. A blanket previously spread upon the table should then be cut and drawn around the injured thigh so as to form a neat covering, and a strip eight inches wide should be extended around the pelvis. This should be drawn smooth and stitched as in a fracture of the leg. A strip of blanket one foot wide and four feet long (the relay), folded upon itself twice, so as to make a strip three inches wide, should be placed with its centre resting on the perineum and the ends brought obliquely upward and outward, the anterior passing over the crest of the ilium, and the posterior over and above the tuberosity of the ischium. While the blanket is being adjusted the patient may be etherized, and as soon as fully relaxed, extension should be made, the scrotum (in the case of a man) having been carefully drawn upward and toward the sound side. The upright bar must be made to bear a little to one side of the median line to avoid injury to the urethra, and especial care must be taken that the blanket strip, called the "relay," should rest symmetrically in the flexure of the thigh and perineum, so as to present a groove along its centre in which the upper edge of the inner side of the splint may rest. Extension is to be made by compound pulleys until the leg is by actual measurement as long as its fellow. If the lower half of the splint has been put on previously, as mentioned above, a trap may be cut over the malleolus to obtain a point from which to measure. Before applying extension strongly, however, the pelvis should be raised about four inches from the table by means of a stout sling, passing around the upper part of the pelvis and over a stout wooden bar stretching from the top of the upright to a stool about two and half feet high, placed upon the table above the patient's head. Pillows should be placed under the head and shoulders to elevate them to a line with the pelvis. The bandages are now to be applied, piecing out the part already on and completing the splint as you pass upward. Pains must be taken to make a neat spica and not to allow the "relay" to become displaced. Small pieces of blanket soaked in plaster "cream" may often be used with advantage to strengthen the anterior and antero-lateral portions of the upper part. Felt or pasteboard may also be used for this purpose, being worked in between the layers. About ten bandages will be needed in all, including those used in making the lower half. After the application is complete the patient should be lowered to the table, but the extension should be kept up until the splint is quite hard. The projecting ends of blanket should then be cut off, and the perineal edge trimmed with oiled silk to prevent injury by wetting, especially in children.

In Vienna, the upright used for counter-extension has a projection from its side, about six inches from the top of the table, on which the tip of the sacrum is made to rest, the body and upper lumbar region being supported by a frame about eight inches high which rests upon the table. In one of the cases given in the table, Dr. Bryant used no upright for counter-extension, but made traction instead upon the "relay" in the perineum. This idea has been still further practicalized by Dr. Van Wagenen, at present connected with Bellevue Hospital, by passing counter-extending bands over the perineum, and having brought them up one on each side, fastening them to a frame upon which the patient lies, which frame raises his body a few inches from the table, while his pelvis projects beyond its edge so that the hands of the surgeon can readily pass between that and the table.

In its application to *fractures of the tibia and fibula*, there is nothing especial to be said except that, these being the most common fractures, this method has here received the most thorough trial. Three good bandages (five yards long) will make a stout splint for most adult legs, unless the fracture should be near the knee, when four may be required, as it is then essential to carry the splint half way up the thigh, and it should in all cases extend to the toes when first applied to insure quiet of the leg muscles. In cases of high fracture of the tibia, it is often advantageous to make a circular amputation of the splint above the ankle after two weeks and begin passive motion of the ankle-joint. This is preferable to removing the leg temporarily from the splint. When there is great tendency to overriding, a good plan is to flex the leg upon the thigh sufficiently to enable the posterior surface of the thigh to act as a surface of counter-extension, the splint being carried above the knee. In Pott's fracture I have used with satisfaction, to produce inversion of the sole of the foot, a Dupuytren's splint applied outside the splint to give it shape while hardening, obviating the necessity of holding it, which may be tedious if the plaster is poor.

One case of Pott's fracture under my charge, complicated with backward dislocation of the foot, was so admirably maintained in position by a gypsum splint as to elicit the commendation of an avowed opponent of the system, who said he could not think of any other apparatus which would fulfil all the indications. When it is desirable to have the lightest possible splint, pasteboard, gutta-percha, or felt may be worked in between the successive layers of bandage, and they will be held so tightly as to be in no danger of slipping even if the splint be entirely removed and replaced. Two strips of felt and two plaster bandages thus disposed make an elegant, effective, and very light apparatus. The use of alum water (℥iv to Oij) in which to soak the bandages renders it possible to make a stiff splint out of two good plaster bandages, but in my hands they have proved brittle, not having elasticity enough to allow of their being sprung off (should there be occasion) without damaging them. Such splints, however, answer admirably after being cut down not only in front, but also posteriorly, leaving only two points of attachment of the two halves, one at the heel, the other at the top, so that the two halves are merely hinged together. The edges of these splints for the leg may be bound with adhesive plaster, so as to prevent their being broken by the surgeon's fingers in springing them open to inspect the leg, and this contributes much to the elegance of their appearance.

In a few cases of *fracture of the patella*, the plaster bandage has been used with remarkable success; in no case, so far as my knowledge goes, with a decidedly bad result. When the joint is tense with effusion, it cannot well be applied, but if there be only a moderate amount it may be used, and indeed, has been, with such a close union of the fragments that it was pronounced bony union. In these fractures, as there is usually little or no contusion, a roller bandage may be substituted for the blanket lining. Two firm compresses having been laid, one below the lower fragment, the other above the upper one, and secured by strips of adhesive plaster, the plaster bandage is then applied from the ankle up, making a figure of 8 around the knee and continuing the splint well up toward the groin. This should be applied while the patient sits on the edge of a table or chair to relax the extensors. Some place behind the popliteal space a light wooden splint, about four inches wide and a foot long, so that more tension may be used in drawing the fragments together by the figure of 8 turns without danger of constricting the limb. It will be seen that the summit of the knee may thus be left exposed for examination of the fracture, and it seemed, in two cases falling under my notice, that there was a decided tilting forwards of the fractured ends from the strong backward pressure of the bandage upon the other extremities of the fragments. This, it was claimed, could be counteracted by carrying additional turns of the bandage directly across the line of fracture, but it has the disadvantage of hiding the fracture completely from view. The number of cases is not, however, yet sufficiently large to enable one to cover up such a fracture with confident expectation of a good result. A compromise may be made by treating the fracture through a large fenestra cut in a stout plaster splint reaching from ankle to groin, which forms a posterior splint incapable of displacement, securing rest of the quadriceps extensor muscle, and affording very convenient points of attachment for straps, strings, or adhesive strips, or whatever one may be using for the approximation of the fragments. In that plan of treatment, which consists in drawing the fragments together by strips of adhesive plaster crossing each other, this form of splint is especially useful, since traction can be made directly downward and the strips fastened to the front of the splint by a few turns of a dry roller, instead of passing downwards and *backwards* as in the ordinary posterior splints, and tilting the fragments forward as already aluded to. If, as some hold, the separation of the fragments is due mainly to effusion into the joint, the success already attained by the use of the bandage alone may be due to pressure stimulating absorption.

In simple *fracture of the ulna* it has in several instances proved itself to be all that could be desired. But as this is not a severe test of its powers it may be passed by with the remark that those who believe in interosseous pads for fracture of the forearm can mould a plaster splint before it hardens by indenting it firmly along the interosseous space, so as to make a prominent ridge when viewed from the inside. For convenience in allowing a coat sleeve to be worn, it is certainly admirable, while impatient but imprudent patients, who would rebel against wearing clumsy wooden splints, by way of precaution, after a fracture had united with tolerable firmness, will readily submit to a light and comfortable gypsum one.

In *Colles's fracture of the radius*, its advantages over other methods are not so evident. Still its record here is by no means a bad one. I succeeded in two cases in obtaining excellent results by using the gypsum bandage from the elbow to the wrist-joint, making the splint especially strong and thick at its lower edge, and holding the fracture reduced by pressure upon the splint until it was quite hard. In one case I used small pads upon the radial and ulnar borders of the lower part of the forearm, so that the splint could be more firmly applied without risk of arterial and venous obstruction. Of course the fingers and hand had to be bandaged with dry rollers. In fractures of the radius high up, the recorded cases are all in its favour. In fracture of both bones with tendency to shorten, counter-extension should be taken from the anterior surface of the upper arm, the forearm being flexed at a right angle and the splint extending about three inches above the elbow-joint.

In *fractures of the humerus* low down the forearm should be flexed at a right angle, and the splint applied from the wrist to the axilla. If there is much shortening, two methods are in use, one that just given, relying upon the weight of the splint for extension; the other where the splint is extended over the shoulder, forming a shoulder-cap, by means of the spica, which closely hugs the axilla and takes its counter-extension from that part. It is claimed by some, that any effective counter-extension from the axilla would check circulation through the axillary vessels, but evidences of serious obstruction complicated none of the cases in which I applied it, although the upper edge of the splint was well imbedded in the axilla. The counter-extension was derived, it seems to me, mainly from the angle of the axillary border of the scapula with the long head of the triceps muscle, the scapula being tolerably well fixed by the spica and a body bandage.—*American Journal of the Medical Sciences, July*, 1872, *p.* 75.

35.—HIP AND SHOULDER DISLOCATIONS, AND THEIR REDUCTION WITHOUT TRACTION.

By Dr. Rushton Parker, Demonstrator of Physiology and Histology at the Liverpool School of Medicine.

[The reader may with advantage refer to Mr. Hutchinson's article on this subject in our last vol., p. 12. See American edition.]

In the communication of my friend, Mr. Henry Arnott, published in the Journal of 24th February. 1872, he quotes some sentences from Mr. Hutchinson's abridged comment on the work of Dr. Bigelow, and further states the undoubted fact that in some London medical schools, University College and Guy's being named, it is taught that in the easiest method by which dorsal dislocations of the hip can be reduced, flexion of the hip is required. Now, Mr. Hutchinson's remarks, as quoted by Mr. Arnott, do not necessarily ascribe to Dr. Bigelow any *priority* in his advocacy of the flexion method of reduction; still less does Dr. Bigelow claim it for himself.

Mr. Hutchinson expresses the opinion, and I think with reason, that "the researches of Dr. Bigelow in respect to our subject," are "amongst the most valuable of recent additions to the science of surgery." Mr. Hutchinson's further assertion that "Amongst the special services which Dr. Bigelow has done, is that of explaining the peculiarity of 'the dislocations into the ischiatic notch,' and of teaching us how to reduce them" is perfectly true, for Dr. Bigelow tells us far more about this form of dislocation than any one else does, and he shows why it is not, and cannot be, a dislocation into the sciatic notch.

Dr. Bigelow fully acknowledges the work of other men on the same subject, and on pages 27—30, he makes a brief historical allusion to the flexion method; citing, among others, Nathan Smith, as far back as 1831, but distinctly mentioning the practice and advocacy of this method by Hippocrates. In France, M. Dolbeau is said to have advocated flexion in 1867, attributing its introduction to M. Desprès, in 1835. It is well known that cases of hip-dislocation reduced, some by flexion and rotation, others by flexion and traction, have from time to time been reported by British and French surgeons in recent years; but Dr. Bigelow has undoubtedly demonstrated how *all* recent dislocations of the hip may be reduced by flexion and other manœuvres without traction.

I do not purpose going more fully into Dr. Bigelow's work, which has less than one hundred and fifty pages of large print, and is really a charming book, fully warranting encomiums even higher than those of Mr. Hutchinson; but I will now state the practical grounds upon which I ask its due for a set of principles which constitute a true "theory of hip-dislocations and of their replacement."

1. I have, on the dead body, repeatedly practised that part of the demonstration of this subject which can be done when the soft structures around the hip-joint have been removed. With the femur connected to the pelvis by only the Y-ligament and the internal obturator tendon, all the four classical dislocations were made—the position of the limb in every case being exactly that described and figured in text-books as occurring in the living body. The reduction of these (and of others) was in every case done by flexion and rotation, with adduction and abduction as required; the course taken by the head of the femur, and the part played by the Y-ligament, being *seen*.

2. One afternoon in July or August, 1869, there was brought to University College Hospital a little girl eight or nine years old who said that, while riding behind a carriage in the Hampstead Road, she had had a fall which immediately resulted in the injury to be described. I saw her about half-an-hour after the accident, and found the right thigh fixed in a state of extreme flexion, the knee being bent and the leg rotated out. A dislocation of the hip was vaguely suspected, but the child would not permit the least tactile examination, any movement of the affected hip causing her to scream out. Chloroform was given to full anæsthesia, during the production of which Dr. Poore, then resident medical officer, brought a dried pelvis to assist the diagnosis. The head of the femur, on careful examination and slight rotation, could now be felt near the tuber ischii. Our concurrent diagnosis was "dislocation on to, or near, the tuber ischii." When the child was fully under chloroform, by suggestion a few circumductions of the thigh were gone through—in the order of flexion, abduction, and extension. As this did not remove the deformity, I did what I had at first intended to do. The ankle and knee were grasped, the knee and hip being flexed; and the femur was rotated in; the head of the bone immediately slipped backwards an inch or two (as I thought, towards the sciatic notch). At once the femur was rotated out, and then the head slipped into the acetabulum, not with a loud snap, which I have never heard in reducing dislocations, but with a sort of "crunch." The actual process of reduction took about five seconds. A starched bandage was applied, and the child was well in two or three weeks, all deformity being absent. At this time I knew nothing of Dr. Bigelow's classical work, nor of the part played by the Y-ligament; or I might have caused the head of the femur to enter the acetabulum by the first manœuvre. I now believe the dislocation to have been "vertically downward."

3. Cases have been from time to time published during recent years, of hip-dislocations reduced by flexion with traction, and by flexion without traction but with rotation and other manœuvres. To the former class belong Mr. Quain's case quoted by Mr. Arnott; a case of Mr. Hulke's; and that of Mr. J. W. Macdonald, and others. To the latter belong the following:—a case of Dr. Hector C. Cameron (*Glasgow Medical Journal*, July, 1867), who reduced a so-called sciatic dislocation in a boy of 14, by flexion and rotation, traction having failed; a case of Mr. Annandale (*British Medical Journal*, 29 January, 1870), who reduced by flexion and rotation, and afterward dissected, a thyroid dislocation in a man aged 19; a case of Mr. Lister's, the reference to which is not at present within my reach, but which was, as far as I remember, one of the downward dislocations, closely resembling my own case, and reduced by the same method.

I would add that the Y-ligament includes the ilio-femoral and ilio-trochanteric ligaments described in Ellis's *Anatomy*, which are one at their upper attachment, rather below the anterior inferior iliac spine.

Dr. Bigelow, then, fully recognising the efforts of others in this direction, has elaborated the great principle which places this department of surgery upon a scientific basis. His book should be read by every practitioner; after which, the physical error and barbarous act of approaching a recent dislocation of the hip with pulleys should be forever scouted.

There are still barbarities practised on the shoulder-joint when it is "out." I know that cases have been published in which luxations of the humerus have been replaced by manœuvring; further, at University College, Mr. Marshall advises it in his lectures on the subject, and describes the process. But the method is not yet largely practised, as far as I know, by house-surgeons, and they are the men who probably come across most of the cases; besides, the ordinary methods generally succeed so well, that it has not become urgent to use this. I did not attempt it properly in a single case when I was a house-surgeon. The following are my grounds for advocating the primary adoption of this method (described with the cases) in shoulder-dislocations, recent and moderately old.

1. I saw a case at University College Hospital in which one of the house-surgeons failed, with chloroform and the heel in the axilla, to reduce a forward and inward shoulder-dislocation, though much force was used, He then elevated the elbow to a level with the shoulder, rotated the arm, and at once reduced the dislocation.

2. My friend and fellow house-surgeon, Mr. R. T. Smith, tells me that he had nine cases, in none of which he used chloroform, and in eight of which he reduced the luxation by this method with little or no pain to the patient, and in an exceedingly short space of time. In one case this method was not tried.

3. I have since had a case myself in which this method was practised. A man, aged 31, fell in getting off the top of an omnibus in Liverpool on October 19th, 1871, dislocating the head of his right humerus inwards and forwards. My father and I were with him soon after the accident, when he was rather "screwed," and his muscles were relaxed. After stripping his shoulders, I raised the elbow on the dislocated side till it was level with the shoulder, then pulled back the elbow in the horizontal plane, by which the head of the humerus was brought outwards by leverage—the glenoid fossa of the scapula, I imagine, being a support for the neck of the humerus to rest on as a fulcrum. Rotation was followed in a few seconds, with but little effort and no pain, by reduction. I believe, but am not quite sure, that rotation *in* was the last reducing mauœuvre.

This is the method which I should employ again in subcoracoid and subclavicular luxations. For downward dislocation, probably great elevation of the elbow would be enough; and for the backward dislocation, elevation of the elbow to the level of the shoulder, leverage of the head of the humerus by drawing forwards the elbow, and, if necessary, rotation. Concerning the two latter luxations, I only say what seems to me the requisite action; but I have never tried it.

This communication contains nothing new that I am aware of, but it deals with matter of fact throughout, except in the speculations about shoulder-dislocations.—*British Medical Journal, Sept.* 7, 1872, *p.* 271.

36.—ON THE TREATMENT OF "PERSISTENT" INFLAMMATION BY THE LOCAL APPLICATION OF SOLUTIONS OF MERCURY AND MORPHIA.

By JOHN MARSHALL, Esq., F.R.S., Professor of Surgery in University College, London.

[The solutions used by Mr. Marshall consist of oxide of mercury dissolved in excess of oleic acid. A small amount of morphia is then added to the solution, and this also doubtless combines as a base with oleic acid. The salts of morphia are not soluble in oleic acid. By "persistent" inflammation is meant inflammation which has become prolonged or persistent in a given locality—whether chronic, subacute, or acute.]

This prolongation or "persistence" of local inflammation may be due to various causes, local or general. Thus the parts affected may not be kept sufficiently at rest, as when a joint is exercised too soon after injury or inflammation. Or the interruption to the cure may be due to the continued performance of some natural function—as, for example, in the case of the tonsils, the glottis, certain orifices of the body, the mammary gland, or uterus,—the condition induced, in such cases, being not so much chronic as "persistent" and severe. So, also, if the general health be disordered—if a gouty, rheumatic, or syphilitic, an anæmic or plethoric condition should exist,—a local inflammation may not disappear, but may be prolonged or become "persistent." Again, supposing this condition to be once established, the products of the inflammatory process, either by their presence or as a consequence of the chemical changes which they themselves undergo, may excite or exhaust the functional activity of the neighbouring nerves, bloodvessels, and other tissues, and may thus induce further irritation, leading, if not to the extension, at least to the prolongation of the inflammatory process. Inflammation of this obstinate type may, of course, terminate in suppuration, ulceration, or gangrene; or it may, by some interference with the nutrition of the affected tissues, impair or destroy the elasticity or strength of parts which serve mechanical uses in the body, or deeply influence their special vital functions.

Now, in the treatment of all inflammation, three chief ends must be kept in view—namely, the relief of the local nervous irritation, the stimulation of the vasi-motor nerves and the bloodvessels, and the promotion of the absorption of the inflammatory educts and products. The mode by which this absorptive process is actually accomplished is so far normal that these inflammatory products and educts undergo a series of changes—namely, softening, degeneration, and solution—quite similar to those through which certain healthy tissues pass when they are no longer needed in the economy; as, for instance, the tissues of the uterus and mammary gland after parturition and lactation are completed. In the quasi-normal as in the normal process, the veins and lymphatics are the agents of absorption. Finally, when the morbid constituents or products are removed, the nervous irritation and the vascular disturbance are allayed, and the part regains its ordinary or healthy condition. In many cases, time, rest from mechanical use or functional activity, and freedom from disturbing influences, are sufficient to ensure this natural process of recovery. In a certain number of instances it will happen that a purgative, a diaphoretic, a stimulant, a tonic, or a sedative, will indirectly promote absorption; and thus salines, alcohol, quinine, iron and morphia, may really act as absorbent remedies, and so especially will food and pure air.

But in the management of the prolonged or persistent inflammation above referred to, further local measures are often indispensable; and, for the purposes of practical illustration, let us suppose we have to deal with persistent inflammation of a *joint*. Here, as of primary importance in the local treatment, must be mentioned immobility and rest, as secured by means of proper splints or other apparatus, accompanied by the use of a sling for the upper limb, and by the maintenance of the recumbent posture for the lower limb. Next may be considered the application of uniform and judicious pressure, by means of cotton-wool confined by suitable bandages. Heat and cold have also their peculiar advantages in particular cases. Lastly, certain medicated applications have frequently to be resorted to. Whether these are employed in the form of lotions, fomentations, liniments, ointments or plasters, they usually contain one or more of the following substances as their active ingredients—viz., alcohol, ammonia, camphor, turpentine, cantharides, iodine, or mercury, with or without chloroform, opium, morphia, or belladonna. Each of these most efficacious remedies is, no doubt, adapted to particular stages of persistent articular inflammation; but every surgeon meets with numerous instances of such inflamed joints which, in spite of care and good treatment, continue obstinately uncured for weeks or months. With some, blisters, and with others, iodine, is the favourite remedy in such cases. Scott's ointment and the mercurial liniment are likewise often employed with great advantage, in both of which applications mercury is the most active ingredient. But mercurial ointment, the basis of these preparations, is merely a mechanical mixture of minute globules of mercury, or of solid particles of the black oxide, with some unctuous substance; and I have long thought that, if we could employ a *solution of mercury in some oleaginous or unctuous medium*, we should obtain more immediate, rapid and satisfactory results from the well-known therapeutical powers of this ancient remedy. The other mercurial ointments now in use, made with the nitric oxide, the subchloride, the ammonio-chloride, or the red iodide, are also essentially mechanical mixtures, and all, as well as the nitrate ointment, are too irritating to be used as topical absorbents. In seeking for my object I first dissolved some of the perchloride of mercury in a small quantity of ether, and added to it about four times the amount of oleic acid; but I found that this combination freely used on the skin produced much irritation, unless it was employed in too dilute a form to be of service as an absorbent. In Gmelin's chemistry there is a short account of certain metallic oleates formed by double decomposition; but with this as a guide, I failed to obtain any satisfactory oleate of mercury. My friend, Mr. Frank Clowes, to whom I then referred the chemical question, soon discovered that, although the ordinary sublimed scales of red oxide of mercury were with difficulty dissolved in oleic acid, the oxide, precipitated by caustic potash or soda from a solution of the metal in nitric acid (which is a yellow impalpable powder) is, when recently made and well dried, readily soluble in oleic acid, especially when aided by a temperature of about 300° Fahr. At my request Messrs. Hopkin and Williams have since studied the subject pharmaceutically, and have succeeded in preparing oleate of mercury, and certain solutions of that salt in oleic acid. The strength of the preparations made by them is indicated by the percentage of the oxide of mercury which they contain. The 5 per cent. solution is a perfectly clear pale-yellow liquid, resembling olive oil, but thinner; the 10 per cent. solution is also fluid and perfectly clear, but as dark as linseed oil; whilst the 20 per cent. preparation is an opaque yellowish unctuous substance, closely resembling in appearance resin ointment, melting very readily at the temperature of the body, and forming a kind of transparent, viscid, colourless varnish when applied to the skin. The chief care to be observed in the manufacture of these solutions is not to hurry the process, and not to employ a high temperature, or the mercury will be immediately reduced.

Unlike the mercurial ointment so long in vogue, which is a crude, gross, unscientific mixture, very dirty and very wasteful, because so small a proportion of its mechanically admixed mercury is but slowly absorbed, these solutions of oleate of mercury are cleanly and economical in use; and as the diffusibility or penetrating power of oleic acid is much greater than that of ordinary oils or fats, and as each one-thousandth part of even a minim of these new preparations contains its proper modicum of mercury, they are absorbed by the skin with remarkable facility and manifest their remedial effects with great promptitude. They should not be rubbed in like ordinary liniments or embrocations, but should be *merely applied with a brush, or be spread lightly over the part with one finger*; otherwise they may cause cutaneous irritation, or even produce a few pustules on the skin, especially in certain persons. This result may, however, be obviated by the addition of a small quantity of olive oil, or purified lard, according as an oleaginous or an unctuous preparation is required. Any of these forms may be scented by the addition of essential oils.

In employing these mercurial solutions for combating persistent inflammation of joints, I soon found that the addition of morphia was of very great advantage. For this purpose the simple alkaloid must be used, as neither the hydrochlorate, the acetate, nor the meconate is soluble in oleic acid. For every drachm of the solution of oleate of mercury in oleic acid one grain of morphia may be added. Being, as well as the mercury, completely dissolved, it quite as rapidly penetrates the skin, comes quickly into contact with the extremities of the nerves, and thus, even within a few minutes, acts upon them at their most sensitive points, and speedily produces a soothing effect.

The oleates of mercury and morphia, thus united in one preparation, represent, as it were, a liniment, ointment, or plaster of mercury and opium; but hey are far more elegant, economical, and efficacious. As a rule, according to he size of the part affected, from ten to thirty drops are sufficient for one application. This should be repeated twice daily for four or five days, then at night only for four or five other days, and afterwards every other day, until a cure is obtained. The morphia immediately begins to relieve pain, allays the nervous irritation and consequent vascular turgescence, and thus arrests the progress or "persistence" of the inflammatory process; whilst the mercury probably promotes the death and degeneration of the morbid products, and so facilitates their subsequent removal by absorption. Unless used in excessive quantity, the oleate of mercury does not salivate, or produce any marked constitutional disorder.

As some of you will remember, I recently tested, in the hospital, the value of these combined oleates in the treatment of a case of "persistent" inflammation of the knee-joint. This affection, I need hardly say, is often difficult to cure, on account of the large size of the articulating surfaces, ligaments, and synovial capsule, and also on account of the great weight supported at the joint, and the frequent disturbance of the parts in the unavoidable movements of the limb and body. Frequently, indeed, this disease leads to irreparable injury to the knee. In the case in question, occurring in a man aged forty-four, the disease had already lasted upwards of eighteen months. From effusion into and about the joint the knee was greatly swollen and disfigured; there was not only synovitis, but, in addition, inflammation and thickening of the fibrous capsule and the ligaments of the joint. He complained of great and constant pain, of a creaking feeling or noise when the knee was moved, and of occasional starting pains at night, probably indicative of threatened or actual softening of cartilage. The skin over the knee was œdematous, and deeply stained with iodine, the remedy which had chiefly been relied upon before his admission under my care. After this stain had been removed, from twenty to thirty drops of the solution of oleate of mercury and morphia (5 per cent. of the former with one grain of the latter to the drachm) were applied to the knee night and morning for about ten days, and then at longer intervals. A piece of linen was kept around the joint; over this was put a smooth, thick layer of cotton-wool, and then the limb was rather firmly bandaged from the foot to just above the knee. During this treatment, the patient, who was of course confined to his bed, rapidly improved in all respects; and at the expiration of four weeks he left the hospital, able to walk by the aid of lateral leather splints, and very far advanced towards a cure. From the first day of their application the effect of the remedies was decided and prompt. I could adduce many other examples equally satisfactory. I select the following:—

A gentleman, aged thirty-one, suffered, about eighteen years ago, for some weeks from an attack of fever, followed by consecutive abscesses in the left hip-joint, which led to stiffness, shortening, and wasting of the corresponding limb. On his recovery, the right leg was necessarily subject to over-use, which, together with occasional blows received at football and otherwise, brought about repeated attacks of capsule-synovitis in the right knee. These at length resulted in chronic thickening of the joint. During the last three or four years, owing chiefly, it is said, to the increasing weight of the body, renewed attacks of inflammation more or less acute led to a state of "persistent" inflammatory disease of the joint, which became much enlarged, deformed, somewhat flexed, and almost immovable. There was pain on the slightest motion, especially on twisting the leg, and such extreme tenderness that the patient shrunk from even an attempt at examination of the knee. There was scarcely any power in the limb; and there were nocturnal startings on falling asleep. Finally, the joint at one part seemed on the point of suppurating, as indicated by increased local heat, redness, and œdema, and by the occurrence of slight shiverings. In consultation with Dr. Sheldon, I ordered absolute rest in bed, the use of two long well-fitted leather splints, and the employment of the combined oleates of mercury and morphia, as above indicated. The first application afforded manifest relief to the local pain. This and the exaggerated tenderness soon subsided, absorption was established, and the size of the joint became so reduced that the splints speedily required renewal; and in four weeks there was complete freedom from pain in and about the knee, and the patient was soon able to walk on crutches with comparative ease. Thus, in a month, a joint, already very seriously implicated, and threatened with suppuration, was practically saved. I can confidently say that I know of no other treatment which would have afforded such satisfactory and speedy relief. I doubt whether Scott's plan would have succeeded in controlling the disease present in this knee; certainly it would not have done so with such promptitude.

I will now advert as briefly as possible to the use of these same preparations of mercury and morphia in the local treatment of "persistent" inflammation affecting other parts or organs of the body. Indeed, their applicability and utility appear to me to be almost coextensive with the occurrence of such inflammations themselves, provided only that the seat of the disease be in, or sufficiently near to, the skin.

I may first mention that not only in persistent articular inflammation, but also in simple synovitis, these remedies rapidly relieve the tenderness and pain, and promote the absorption of the fluid effused into a joint. They are also of decided benefit in the rheumatic, the arthritic, and the mixed forms of joint disease; but in these they do not, of course, supersede the necessity for general treatment. In inflammation of the mammary gland occurring during or after lactation, or altogether independently of that secreting process, their efficacy is unequivocal; for I have seen, not only the induration left after previous abscesses speedily disappear under their use, but a tendency to recurrent suppuration in the site of old abscesses, and the threatened formation of new ones, entirely controlled and arrested. I have also seen a threatened abscess in the perineum from inflammation of one of Cowper's glands, and likewise the troublesome indurations left after ordinary perineal abscess, rapidly disappear on the use of these preparations. In obstinate and painful tonsillitis, in epididymitis, in periostitis, and in inflammation with imminent or actual suppuration in or around lymphatic glands, I have similarly employed them with decided advantage. In hydrocele they have not appeared to be useful. I have used equal parts of the 20 per cent. ointment and purified lard applied outside the eyelid, with success, in hordeolum and in palpebral conjunctivitis.

In many cutaneous affections the oleate of mercury solutions, without morphia, form elegant and powerful remedies. It was in a case of obstinate sycosis menti that I first used, and with excellent results, an etherial solution of the perchloride of mercury mixed with oleic acid; but I now much prefer, as equally efficacious and far less irritating, the five per cent. solution of oleate of mercury in oleic acid, with the addition of an eighth part of ether. This, when applied to the skin with a camel-hair pencil, is a most diffluent and penetrating remedy. It enters the hair-follicles and the sebaceous glands, penetrates the hairs themselves, and carries everywhere with it its powerful metallic constituent. Besides sycosis, it will cure chloasma and the various forms of tinea; it is useful in porrigo and in pruritus ani et pudendi: but I have not found it serviceable in non-specific psoriasis or in eczema. The solution of oleate of mercury destroys pediculi immediately; and, owing to its singular power of permeation, simultaneously kills the ova—a result not always certain when ointments containing undissolved mercury are used.

Again, in many of those syphilitic affections for the cure of which mercury is applicable, the oleate-of-mercury preparations offer some advantages. Thus, in congenital syphilis, a piece of the 20 per cent. ointment, about the size of a pea or bean, placed in the child's axillæ night and morning for five or six days, rapidly and easily, and without any sign of uncleanliness, produces constitutional effects. Even in the adult this mode of introducing mercury into the system, either for the cure of syphilis or other disease, may often be preferable to, and less troublesome than, the bath, and it certainly gets rid of the objections to the ordinary mode of inunction. As a topical remedy for certain local manifestations of syphilis, such as the non-ulcerated form of syphiloderma, especially when these disfigure the head, face, neck, or hands, the 10 per cent. solution is a most valuable adjunct to other treatment, the spots rapidly disappearing under its use. This or the 20 per cent. preparation, diluted with equal parts of purified lard, may also be applied to non-ulcerated syphilitic indurations and condylomata, but it gives pain if applied to surfaces much excoriated or ulcerated, to moist warts, or to mucous membranes. In syphilitic iritis, and also in non-specific forms of that disease, this diluted oleate ointment smeared over, not within, the eyelids evidently promotes the absorption of the effused lymph. Lastly, in some of the remoter kinds of syphilitic affections, which iodide of potassium will usually cure, such as very hard nodes and certain forms of syphilitic testicle, the external application of the oleate of mercury is very valuable. I have seen a case of enlarged testicle and epididymis, the syphilitic origin of which had not been suspected, and for which no mercurial course had been prescribed, but which during a period of six years had been, from time to time, relieved by enormous doses of iodide of potassium, speedily and decidedly benefited by the inunction of the 20 per cent. mercurial oleate.—*Lancet, May* 25, 1872, *p.* 709.

37.—ON THE SPIRAL SPRING EXTENDER; BEING A NEW AND SIMPLE APPARATUS FOR MAKING EXTENSION IN DISEASED JOINTS, &c.

By C. Holthouse, Esq., Surgeon to the Westminster Hospital.

[This apparatus is intended for the purpose of keeping up any amount of traction on a limb or joint, without necessarily confining the patient to bed, or preventing him from taking bodily exercise. The author considers it as efficient as Sayre's splint, and much simpler and cheaper.]

My apparatus consists of a simple spiral spring, covered with leather, flannel, or linen, and having two buckles at one or both extremities. When extended, it forms a cylinder closed at the sides but open at each end; and when the coils of the spring are pressed together it approaches in form to a discoid ring or a closed concertina. It need not, however, necessarily be cylindrical, but larger at one end than the other, in conformity with the tapering shape of the limb. It can be made of any length, size, or strength; and the traction-force exerted can be regulated with the utmost exactness; while its cost need not exceed five shillings.

Application of the instrument.—This is extremely simple. If the hip be the joint which it is wished to extend, two square pieces of strong diachylon plaster having a piece of boot-strapping, from six to eight inches in length, fixed to the centre of the lower border of each, should be applied to the upper half of the thigh, one on each side. The plasters should be sufficiently large to surround, or nearly so, the circumference of the limb, and should be applied evenly by their whole surface; for further security they may be surrounded by a roller bandage applied in the ordinary manner. Over the limb thus prepared the cylinder, previously compressed, is slipped, the foot, of course, being extended as in pulling on a boot, and it is drawn up the limb till its larger end is supported by the perineum; this serves as its fulcrum. The tapes on the plaster being now buckled to the lower end of the cylinder, it will be obvious that any amount of traction on the hip-joint may be obtained, according as it is buckled tightly or loosely; the first will, of course, approximate the rings of the cylinder, and so increase the traction of the spring; while, in the latter, the rings being further apart, less force is necessarily brought to bear on the joint. The exact amount of traction-force may always be known by trials made with the cylinder previous to its application, and for convenience the tapes may be divided into inches. If the knee be the joint affected, two buckles must be fixed on the upper end of the cylinder as well as the lower, and the tapes which are attached to the plasters on the thigh must correspond with their upper instead of their lower borders. The plaster must, moreover, encircle the lower instead of the upper half of the thigh. On the leg the tapes must hang downwards, and the plaster be applied just below the knee. In some cases it may be advisable to substitute splints for plaster, in which case the two ends of the cylinder may be supported by buttons or hooks on the outer surface of the splints.

Although the spiral spring extender may be most frequently called into requisition in cases of joint disease, it may be employed with advantage in many fractures and dislocations, as well as in excision of joints, when it is desirable to keep the bones asunder. In amputations, especially of the thigh, it is peculiarly eligible where the flaps have been made too short, or have become so by sloughing, the pulling forward of the integuments by this instrument taking off all tension from the sutures, much in the same way as Hainsby's instrument does in cases of hare-lip.

To sum up. The chief merits of this instrument, and its superiority over the weight and pulley, rack and pinion, and other mechanical contrivances for making extension, consist in its great simplicity, cheapness, lightness, and efficiency; the patients being in many cases able to take out-door exercise, and thus avoid the injurious effects of long confinement in bed.

The above have been made for me by Messrs. Mayer and Meltzer, of Great Portland Street.—*Lancet, June* 8, 1872, *p.* 789.

38.—NEW METHOD OF PUTTING UP FRACTURED CLAVICLE.

By Dr. LEWIS A. SAYRE, Professor of Surgery in the Bellevue Hospital Medical College, New York.

The *American Practitioner* for July, 1871, contained a description of the method of dressing fracture of the clavicle, which we are assured will commend itself to our readers. It is thus described:—

"Strong and good adhesive plaster (Maw's moleskin is the best) is cut into two strips, three or four inches wide (narrower for children); one piece long enough to surround the arm and go completely round the body, the other to reach from the sound shoulder around the elbow of the fractured side and back to the place of starting. The first piece is passed around the arm just below the axillary margin, and pinned or stitched in the form of a loop sufficiently large to prevent strangulation, leaving a portion on the back of the arm uncased by the plaster. The arm is then drawn downward and *backward* until the clavicular portion of the pectoralis major muscle is put sufficiently on the stretch to overcome the sternocleido-mastoid, and thus pull the inner portion of the clavicle down to its level. The plaster is then carried smoothly and completely round the body, and pinned to itself on the back to prevent slipping. This first strip of plaster fulfils a double purpose: first, by putting the clavicular portion of the pectoralis major muscle on the stretch, it prevents the clavicle from riding upwards; and secondly, acting as a *fulcrum* at the centre of the arm, when the elbow is pressed downward, forward and inward, it necessarily forces the other extremity of the humerus (and with it the shoulder) *upward*, *outward*, and *backward;* and it is kept in this position by the second strip of plaster, which is applied as follows: Commencing on the front of the shoulder of the sound side, drawing it smoothly and diagonally across the back to the elbow of the fractured side, where a slit is made in its middle to receive the projecting olecranon. Before applying this plaster to the elbow, an assistant should press the *elbow well forward and inward*, and retain it there, while the plaster is continued over the elbow and fore-arm (pressing the latter close to the chest, and securing the hand near the opposite nipple); crossing the shoulder at the place of beginning, it is there secured by two or three pins.

"When this has been done, the deformity will have entirely disappeared, the fractured bones will be accurately adjusted, and as long as the strips of plaster maintain their position, no amount of force can displace them."—*Medical Press and Circular, Sept.* 4, 1872, *p.* 194.

39.—DR. SAYRE'S SPLINT APPLIED TO FRACTURED NECK OF FEMUR.

By WILLIAM COLLES, Esq., Surgeon to Steevens' Hospital and Lecturer on Surgery in the Hospital College.

The various applications recommended at different times, and the continued alterations proposed in the form and adjustment of splints for the treatment of fracture of the femur, sufficiently indicate that a proper apparatus for these injuries is still a desideratum.

This want is more apparent in treatment of fracture of the neck of the femur than most others; here we have to deal with, in general, an infirm old female whose health is failing, who is subject to various bronchial affections, whose bones have become more liable to fracture, whose flesh is more apt to suffer from pressure or damp—all which are not found in younger persons; but besides all this, the surgeon cannot insist on the necessity of strict obedience to his directions as to the use of position and splints, as they rarely afford a prospect of obtaining a sound and useful limb.

Still we do not like to abandon these cases, and to leave them without any support or extension, or some effort to assist nature's efforts at union—bony or ligamentous.

We will not now allude to many of the various positions and appliances recommended for the treatment of this affection, as I believe the majority of surgeons use the long splint, Liston's, or some of its various modifications; this, in a fractured neck of femur in old persons, is liable to the objections—first, that it keeps the patient's body and limbs in a perfectly straight line, preventing any motion of the patient, so that we are often obliged to leave it off or relax it, to change the position of the patient for purposes of cleanliness or comfort; or, as often happens, the breathing becomes affected, and the patient requires to be placed in a sitting or semi-erect position, and we must again relax the splint. The perineal band is also a source of suffering, causing inflammation, ulceration, or even sloughing beneath it; for it has to bear not only the pressure of the extension, but much force applied to it is lost; for if we consider the action of the long splint fixed to the body by the perineal bands, and also a girth round the pelvis, when these are tightened they act on the trochanter as a kind of fulcrum, and much force is expended in pressing this projection of bone inwards towards the pelvis, and this pressure on the fracture under consideration must add to the patient's suffering, pressing the two rough surfaces of bone together, and may interfere with the process set up for union either by ligament or bone.

I have long tried various forms and kinds of splints for the treatment of this injury without meeting any one to give satisfaction, till I read the interesting lecture of Dr. Sayre, recorded in the British Medical Journal (see *Retrospect*, vol. lxiv. p. 147), where he describes the splint for morbus coxæ, where the extension is fully kept up, and the patient is enabled to bear the weight of his body on the instrument with ease and comfort.

Having been called to a case of fractured neck of the femur in an old lady, I resolved to try a modification of this splint, so as to make it suitable to the injury, and quickly and cheaply constructed. The instrument consisted of three parts—first a pelvic portion about two inches deep and six inches broad, padded and falling to the brim of the pelvis lying over the trochanter and pressing on the os innominatum; this must be retained in its place by a perineal band. 2nd. The thigh splint—a bar of iron half an inch broad, joined to the pad by a ball and socket-joint—stands out horizontally for an inch or so to carry it beyond the trochanter, where it bends down and lies close to the femur, and projecting an inch or two beyond this bone. The third portion is the knee-piece—a broad band of iron embracing the front and inner portion of the knee, the remaining circle of the limb being held by a strap and buckle. This knee-piece slides along the thigh splint, and may be fixed by a screw, or, what I prefer, a strong elastic band passing from the screw head to a knob fixed on the lower end of the splint, because we have a constant and steady extension kept up which we can increase or lessen as we find necessary. The instrument was made for me by Messrs. Adam and Corcoran, Ormond Quay. This splint is certainly open to the objection of the perineal band, but the pressure on this is reduced to the minimum, because the extending force acts on the pelvic pad, and the stronger it is the more it presses this pad against the pelvis, so that the entire strain is not on the perineal band as in the ordinary splint. In the case in which I tried it the splint gave me great satisfaction; it kept the limb well *in situ*, prevented the common shortening and eversion, and was not inconvenient to the patient; and I have no doubt but that it will be found useful not only in this fracture but I should think in many other fractures of the bone, and might even be utilized in artificial limbs, where we wish the pressure to be borne on as extensive a surface as possible—for which purpose I recommend it to the notice of the profession.—*Dublin Journal of Medical Science, March* 1872, *p.* 187.

40.—THE ANTERIOR SUSPENDING SPLINT IN THE TREATMENT OF FRACTURES OF THE LOWER EXTREMITY.

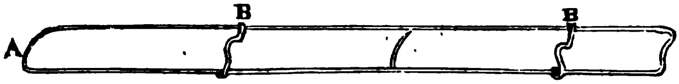
By Dr. Charles Shrimpton, Paris.

[The anterior suspending splint was invented by Professor Smith, of Maryland University, U. S. A.]

The apparatus is of itself extremely simple; a splint made of two parallel wires of sufficient length to extend from above the anterior superior spinous process of the ilium to beyond the extremity of the toes, a suspending cord, some wadding, and some bandages.

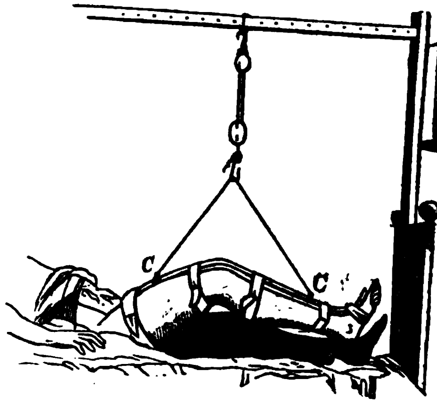
The splint I now employ is made with the parallel wires kept an inch and a half from each other by four transverse fixed bars. (Fig. 1.) B B are sliding bars, made with curves in the centre to receive the hooks of the suspending cord. The suspending cord is formed of two parts, one to hang perpendicularly from its support, the other with a hook at each end, to be attached to the sliding bars of the splint. This part of the cord passes through a pulley, which is hooked to the extremity of the perpendicular cord. The perpendicular cord, as seen in Fig. 2, is double, with a block in the middle, so that the limb may be raised or lowered by lengthening or shortening the cord at will. The wadding to be placed on the surface of the limb before the splint is applied. A double stout band to pass round the pelvis, and fix the upper part of the splint. Five short pieces of band, one to pass round the foot and the splint, two in the same way round the leg, and two round the thigh to keep the splint in place whilst it is being adjusted. Several strong rollers to be applied to the whole length of the limb, to replace the short bands, which are to be withdrawn as the roller is applied. The accessories to the apparatus are the pincers, which are very convenient for bending the splint *in situ*, to adapt it to the limb. The wood-frame supports the suspending cord. A can, trough, and syphon for irrigation, complete the apparatus.

Fig. 1.



The print represents the splint *in situ* before the roller-bands are applied. The limb is supported by the temporary short bands. The wadding has been withdrawn to show that the wires cease to touch the limb as soon as it is suspended.

Fig. 2.



Very little remains to be said in describing the mode of application of the splint. The fractured limb should be left, as it may then be, until the splint has been adapted to the *sound* limb, in order to take its exact length, bends, &c. The suspending cord now fixed, and the splint prepared with a bend corresponding to the groin of the fractured limb, we may proceed to suspend the limb. The large double thick band is to be attached to the upper part of the extremity of the splint, and passed firmly round the pelvis. The wadding is to be placed on the front part of the fractured limb to receive the splint, and the short bands are now to be tied *lightly* round the foot, leg, and thigh. This done the limb can at once be suspended by the cord without any attempt at reduction, and the reduction will take place almost of itself by the mere weight of the limb. As soon as the splint is perfectly adjusted *parallel to the axis of the limb* the rollers may be *lightly* applied, leaving any part requiring dressing free from every kind of bandage. The wounds may thus be attended to without interfering in any way with the rest of the apparatus. Extension and counter-extension are necessary only to bring the limb to the length of the splint whilst the rollers are being applied.

The following case illustrates the advantages to be derived from the anterior suspending splint. This was a case of gunshot wound fracture of the left leg just below the insertion of the ligamentum patellæ. The subject of it was a French soldier wounded during the siege of Paris. Cure without shortening or deformity of the limb, though the tibia was comminuted to the extent of more than an inch. The patient was enabled to move in his bed at pleasure during the whole period of treatment.

Adolphe C., aged twenty-one, of good constitution and healthy temperament, a soldier of 117th Regiment of French Infantry, received a gunshot wound of the left leg at noon on November 31st, 1870, at the battle of Champigny. On the field, very soon after he fell, Sir John Rose Cormack dressed the wounds and applied a temporary apparatus to the fractured limb. The wounded man was then wrapped in a blanket, placed on a stretcher, and carried the distance of at least two miles over very rough ground, and in a bitterly cold wind. He remained in the "Ambulance volante" for six hours before the journey to Paris could be undertaken. After much jolting and many delays he reached the ambulance, 16, Rue Demours, at 4 a.m. on December 1st. He was then very cold and exhausted. After the administration of warm broth, a full dose of opium, and the bathing of the feet with hot water, he fell into a quiet sleep for some hours, and was in a pretty comfortable state when Sir John left the ambulance about 11 a.m. on the 1st to return to Champigny, where he remained until the morning of the 3rd, the battle having been renewed with great fury on the 2nd. On the 3rd, in consequence of the pain and swelling of the limb, Sir John relieved it from pressure, placed the fractured limb in a trough, and ordered irrigation. In the afternoon of that day, about seventy-six hours after the wound was received, Sir John showed me the case, and asked me to apply the anterior suspending splint.

I found the limb much swollen. The man was in a state of great nervous excitement, and complained of great pain in the region of the wound. The ball had passed through the left leg, entering on the inside a little below the insertion of the ligamentum patellæ, passing obliquely downwards and outwards, making its exit about the middle of the opposite side of the leg, thus producing an extensive comminuted fracture of the tibia. The leg probably was raised in the act of running when he received the shot.

The anterior suspending splint was readily applied, and the patient felt great relief as soon as the limb was abandoned to its own weight. He could move himself freely in his bed, raise himself by the aid of the hand-cord to allow the bed-pan to be placed under him, to have his sheets changed, &c., without the least fear of disturbing the fractured limb. The two wounds, the entrance and exit of the ball, were left perfectly free for the daily dressings, the application of poultices, &c. This system of suspension was found very convenient in giving every facility to the surgeon to examine every part of the limb without disturbing the fracture, and without giving any pain to the patient. The bandages were removed and renewed frequently with the greatest ease, and giving great comfort to the patient.

Several abscesses formed and were opened in different parts of the limb. With this exception the patient progressed favourably.

Feb. 18th, 1871. The ambulance in which he had hitherto been treated was about to be closed. The patient had to be moved to the ambulance, 16, Rue d'Agnesseau, maintained by Sir Richard Wallace. The suspending splint was of great service on this occasion in protecting the limb from the effects of any shock or commotion during the transit. A few days after the transit a large piece of necrosed bone, which had formed part of the internal surface of the tibia, was extracted. This piece of bone was at least an inch square, so that the loss of substance, the other fragments of the comminution considered, involved at least an inch of the entire thickness of the tibia. The consolidation of the fracture was, however, found to be sufficient at this time to allow the suspending apparatus to be applied only at night, leaving the limb free during the day, so that the muscles might gradually recover their power, and the joints their flexibility. Two other pieces of necrosed bone were extracted about this time.

The apparatus was entirely removed on the 15th March, and the patient, after walking on crutches for a fortnight or three weeks, was enabled gradually to make use of his limb. One other piece of necrosed bone was removed after he was able to walk. He has now recovered the use of his limb for more than twelve months. There is no shortening of the limb, only a slight indentation where the tibia had been fractured, and a very small fistulous opening still remains, indicating the process of elimination of some other portion of necrosed bone. The limb is not otherwise deformed, and the man walks as well as he ever did. His left leg is almost as strong as the other; the muscles are developed, and the poor man has been in great distress fearing he may be called to continue his military service.

It will be observed that the patient felt relief directly the limb was left to its own weight. He very soon abandoned the limb altogether to the apparatus, feeling complete confidence and security in the suspension, and was thus enabled to move himself freely in his bed. This security of the patient is accounted for by the action of the splint, which, being placed *parallel* to the axis of the limb, carries the action of the weight of the limb on the bandages from the splint to the axis of the limb, thereby holding the fractured bone steadily in all the movements of the body. The splint becomes a substitute for the fractured bone, the fragments of which are kept constantly in position, so that the process of ossification is not disturbed by any movements of the patient.

The fracture was so comminuted in this case that we may safely say there was loss of substance of at least an inch in length of the bone, yet the limb moved as freely on the suspension as if there had been no solution of continuity at all. Some portions of this comminuted bone having retained their periosteum served with the callus to consolidate the fractured tibia; the remainder became necrosed and was either extracted or thrown off afterwards.

It is important to remark that the usual pain in the heel and the violent spasmodic contraction of the muscles are effectually prevented by the action of the suspending splint. The continued action of extension and counter-extension and all violence in reduction are superseded by the action of the weight of the suspended limb. The fractured bone must inevitably recover its natural length and position to adapt itself to the splint, which has been modeled on the *sound* limb. The muscles of the fractured limb lose their power of contraction by the uniform compression of the bandages which suspend the limb.

The reasons why the anterior suspending splint has not been universally adopted appear to me to be because the principle on which the splint acts has never yet, I believe, been explained, and because it is so difficult to abandon our old friends—the old splints, the double inclined plane, &c.

The splint employed by Professor Smith until he came to France was nearly four inches in width between the wires. That which I employed myself at that time was about three inches wide. Under these circumstances, not being yet aware of the principle of action of the splint, I was naturally inclined to increase the width between the branches, thinking I might thereby increase the action of the splint. After a time, however, I discovered that the nearer I brought the wires together the greater was the facility I acquired in the application of the splint. *This led me to discover the action of the anterior suspending splint on the axis of the limb—the principle on which, I believe, the whole system is based.* The splint I now use is only one inch and a half wide between the wires, a distance which appears to me to be the most useful and safe in its application. I am convinced that the splint has been brought into disrepute, and been abandoned by many surgeons, because they, like myself, have employed the splint with the branches too wide apart.

Probably the second reason why the anterior suspending splint has not yet been universally adopted is that which I have already hinted at—viz., that we cannot so easily depart from the habits of routine in the treatment of fractures of the lower extremity. It has been supposed that by placing the suspending cord more or less obliquely from the perpendicular line, a power of traction or extension was obtained. I thought so, and have frequently tried it, but always without any advantage. I can account for this now, I think. I asked myself if it is not evident that, as the splint must be attached to the part of the limb above the fractured bone—viz., to the pelvis above the femur, to the femur above the leg, all the traction produced by the oblique suspending cord must act on the pelvis in cases of fracture of the femur, and on the femur in cases of fracture of the tibia. In fact, the action of the oblique cord cannot possibly have any power at all on the fractured bone. On the contrary, by taking the cord from the perpendicular the action of suspension on the axis of the limb is considerably weakened. *The perpendicular cord, in supporting the splint uniformly through its whole length, brings the weight of the limb to act uniformly on its own axis. The cord therefore should never be moved from the perpendicular.* The theory of the action of the obliquity of the cord has most probably been very injurious to the reputation of the anterior splint.

It would only be a repetition of details if I were to apply them to all the surgical cases of the lower extremity. I must, however, add that the anterior suspending splint seems to find its special application in cases of fracture of the neck of the femur, and in the transverse fracture of the patella. In fractures of the neck of the femur, either within or without the capsular ligament, the only recommendation is to fix the thigh immovably on the pelvis, and in fractures of the patella to keep the splint quite straight from the groin to the instep. The straight splint, as above applied in the case of fractured patella, is applicable precisely with the same advantages in suspending the limb after resection of the knee-joint.

I have selected the above case from others equally illustrative of the numerous advantages of the anterior suspending splint over every other apparatus in the treatment of fractures of the lower extremity, but having already taken up so much valuable space in regard to this one, I reserve the remainder for future elucidation should the above description be considered too imperfect or obscure.—*Lancet, July* 20, 1872, *p.* 78.

41.—ELEVATION OF DEPRESSED CRANIAL BONE BY PNEUMATIC TRACTION.

By H. W. Larkin, Esq., Bilston.

The operation of trephining is a hazardous one. Even in the best hands it is attended by no small risk of wounding the dura mater, and thereby inducing fatal encephalitis. The operation is, from this cause, almost as perilous as the condition which it is intended to relieve. So far is this true that in this country, according to Erichsen, about seventy-five per cent. of the subjects operated on die; whilst across the channel its history is still more unfortunate.

I have recently, in a case of persistent congenital depression of cranial bone in a child, employed pneumatic traction with complete success; and I believe that in many, perhaps most, cases of depressed fracture of the skull, whether occurring in children or adults, this mode of elevation will be found not only more easily practicable, but infinitely safer than that by the trephine.

A short time since I was called to a child a few days old, the site of whose right frontal eminence was occupied by a depression of about an inch and a half in diameter. At birth the child's head had presented abnormally. The maternal expulsive pains had been very strong, the pubic arch somewhat angular, and the child's right temple driven in. Unlike similar depression of the parietals, which is usually transient, being righted, *sua sponte*, immediately after the liberation of the head, this was persistent.

The concavity thus formed was not regular—such as is produced in a thin convex metallic plate when pressure is made on one point of its surface—for in addition to the ridge which formed the circumferential line of the depression, there were two sulci crossing it. The sharpness of the ridge and sulci respectively indicated that the elasticity of the bone had been overtaxed, and that permanent deformity was a probable result. With the view of restoring the bone to its proper shape, a cupping-glass was applied over the depressed portion. Difficulty of exact adaptation was overcome by forming a cell of ordinary glazier's putty. Exhaustion was effected by a small air-pump. A few seconds proved the experiment successful, for the depressed bone gradually rose and assumed its normal contour. The glass was allowed to remain a few minutes, and was temporarily re-applied the following day. There was no observable constitutional disturbance. The temples are now symmetrical.—*Lancet, Oct.* 5, 1872, *p.* 490.

ORGANS OF CIRCULATION.

42.—THE SURGICAL TREATMENT OF ANEURISM IN ITS VARIOUS FORMS.

By TIMOTHY HOLMES, Esq., M.A., Professor of Surgery and Pathology to the Royal College of Surgeons.

[Now that deep-seated aneurism in the abdomen, and even aneurism of the lower part of the abdominal aorta itself have been permanently cured, surgeons have begun to regard no form of aneurism, however near the heart, as absolutely incurable. The main propositions which Professor Holmes endeavours to establish, in the course of which the following article is the substance of the first lecture, are as follows:]

1. That aneurisms, of whatever form and however near the heart they may be, ought not to be regarded as incurable, but should be made the objects of definite methodical treatment, internal or external.

2. That there is definite proof, from pathological anatomy and from surgical experience, of the curative influence of Brasdor's operation in innominate aneurism, and of its beneficial effects in some cases of aortic aneurism.

3. That arteries may be successfully tied and obliterated without their continuity being interrupted; and that this modification of the ligature, whilst affording much security against secondary hemorrhage, and thus much diminishing the danger of the operation in general, may very probably in future enable surgeons to deal successfully with cases in which it may be necessary to tie the first part of the subclavian (whether on the distal or proximal side of an aneurism) or the innominate artery.

4. That galvano-puncture may be used with at any rate temporary benefit in thoracic aneurism; that its use is not so dangerous as to render further trials of it inexpedient; and that there is good hope that the method may be so far perfected as to make it a safe and regular plan for the treatment of thoracic, subclavian, and other forms of aneurism.

5. That many cases, such as those in which ligature of the artery near to the heart has been resorted to for the cure of subclavian and subclavio-axillary aneurism, may be made amenable to improved methods of pressure.

6. That aneurismal tumours situated even as high as the lower part of the abdominal aorta, those of the mesenteric and other branches of the aorta, and of the iliac arteries, may be treated with success by rapid coagulation of blood under pressure; but that this method is a dangerous one, and should not be used until internal treatment has failed.

7. That there are cases of abdominal aneurism in which Mr. Syme's suggestion of reviving the old operation is worthy of further trial.

Numerous instances are on record in which persons affected with aneurism of the arch of the aorta have, either spontaneously or as the result of medical treatment, been restored to a condition of tolerable health, have lived for a long period of time, and have ultimately died from other causes.

But allowing that it is difficult to obtain complete consolidation in an aneurism of such large arteries, and that the cure when obtained affords no guarantee for permanent recovery, it is still evidently our duty to attempt the treatment of the disease if cure is possible—nay more, if even alleviation and the prolongation of life is possible. Now this latter is not only possible but easy. Judicious medical treatment, with rest systematically enforced, is almost always followed by temporary improvement. And in aneurisms which are growing in any definite direction, and whose growth in that direction threatens important organs, or is likely to lead to rupture of the sac, there is always a chance of stopping such growths for the time, and so possibly preserving the patient's life. I venture to say that this point is hardly enough considered. We think so much of whether an aneurism can be completely consolidated or not that we are apt to forget how often its partial consolidation only is followed by such an alleviation of the symptoms as amounts almost to temporary cure.

It being admitted that cases of growing aneurism, affecting the thoracic aorta, or the innominate, or the roots of the left carotid or subclavian within the thorax, or affecting the aorta and one or more of its primary branches simultaneously, are not to be regarded as wholly incurable, the next question is, What are the means hitherto devised for their treatment? They are three in number—namely: internal or medical treatment; the distal ligature, or Brasdor's operation; and galvano-puncture.

I pass over the injection of ergotine into the cellular tissue around the sac, which has been said in a foreign medical journal to have been recently recommended by Langenbeck, since that distinguished surgeon has not as yet published his own version of the proposal. The theory of the matter as explained by the journalist seems to me utterly unintelligible, but I have made trial of the method in two cases, with results which were perfectly nugatory; and I have not succeeded in discovering that the experience of others has been more satisfactory. I pass over, also, the plan of introducing a mass of fine iron wire into the sac, as practised by my late friend, Mr. Moore; since I think no one will deny that it is not more certain than galvano-puncture, while it is far more likely to cause inflammation of the sac-wall. Since Mr. Moore's death, the operation, I find, has been twice repeated—namely, by Dr. Murray of Newcastle, in a case which terminated by suppuration of the sac; and by Mr. Dumville of Chatham, without any definite result. The sac has also been transfixed with fine needles with the same object.

With regard to the internal or medical treatment I shall say very little, since I could add nothing to the admirable exposition lately given of it by Mr. Jolliffe Tufnell. The extreme bleedings recommended by Valsalva have been discarded as calculated to excite the heart to irritable action and to impoverish the blood, thus both impairing nutrition, and so endangering the rupture of the sac, and rendering the blood less fit for coagulation. But the valuable parts of Valsalva's treatment have been retained and methodised. The patient is confined strictly to the recumbent position during a very long period, the most minute precautions being taken to ensure that he can be kept without raising himself once from the bed during many weeks; his food is restricted to the smallest quantity of nutritious solids that can satisfy his appetite, and his drink to the very smallest quantity which can be tolerated. Much stress is justly laid by Mr. Tufnell on this latter precaution, and Dr. Sibson also testifies to the extreme importance of restricting the quantity of fluid to the lowest possible point. The medical treatment of the case otherwise consists almost exclusively in the administration of such narcotics as may be absolutely necessary to calm pain and procure sleep, and such purgatives as may be required to keep the patient comfortable, and avoid all straining in defecation. The great object is to keep the pulse at an equable rate, a little over 60, and free from all excitement. Though Valsalva's extreme bleedings are avoided, a very small venesection may be occasionally serviceable with this view. I would strongly urge any surgeon undertaking for the first time the care of a case of internal aneurism to study Mr. Tufnell's invaluable little pamphlet, which shows how much may be done for the relief of conditions usually regarded as hopeless, and by how simple, safe, and painless a method.

Brasdor's operation rests upon a sound pathological basis, so far as this—viz., that we have preparations in sufficient number to prove to us that impaction of clot in the distal end of the artery as it leaves an aneurismal sac is naturally (I do not say necessarily) followed by obliteration of that portion of the sac which is distended by the stream of blood formerly passing up the closed artery; that such obliteration, even when it stops short of the consolidation of the whole tumour, may suffice for the removal of all symptoms of the disease; and that precisely the same effect would follow naturally (but here again I do not say necessarily) on the distal ligature of the same vessel. This being granted, it follows that there are some cases of innominate aneurism which may be completely cured by Brasdor's operation.

The condition of an artery immediately after ligature varies much. In some cases an artery which, like the carotid, runs a long course without branches will be filled with clot from end to end (as in Dr. Wright's case); in others, as in Sir W. Ferguson's, no clot whatever will be contained in it. And the same thing is seen at a later period. Sometimes after division only a very small part of it is obliterated; at others the whole artery between the nearest considerable branches is converted into a solid cord. This must have its effect upon the obliteration produced in the tumour by the distal operation. If the blood is so indisposed to coagulate that after the ligature of the carotid no coagulum forms in the artery, it is probable that coagulation will go on but slowly or imperfectly in the sac. In those cases, on the other hand, where the artery is completely filled with coagulum, the blood in the sac will also show a strong tendency to coagulate: first the ordinary blood-clot will form, and this will subsequently become laminated, as happens after the ordinary operation.

It seems doubtful whether we can entertain the same expectation of complete obliteration of the sac from distal obliteration of the arteries when the tumour is partly aortic. An interesting case is here in point, communicated to the Pathological Society (*Trans.*, vol. xx., p. 118) by Dr. Douglas Powell. In this case an aneurism, arising from the arch of the aorta, and involving that artery from above the origin of the innominate to below that of the left carotid, implicated the innominate in its whole extent, and it must have been impossible during life, as far as I can see by the recorded symptoms, to have diagnosed this from a purely innominate aneurism. After death it was found that the carotid artery had been converted into a solid cord from end to end. The right subclavian was also obliterated at its origin, though this, as I am informed by Dr. Powell, must have occurred very shortly before death, since pulsation in the right wrist, which had been absent during the presence of a considerable effusion into the pleural cavity, returned on its removal, and was perceptible till within a few days of death. Here, however, the circulation through the sac was kept up by the stream of blood traversing the aortic and left carotid orifices, and only a little laminated clot was found at its upper part. This deposit of clot was connected in all probability with the coagulation of blood in the carotid artery. And the analogy of the preparations of innominate aneurism above referred to justifies me, I think, in saying that, in an aortic aneurism also, the obliteration of any of the arteries, such as the right or the left carotid, which lead directly out of the sac, will be followed by consolidation in that part of the sac which is distended by the stream of blood formerly passing up the obliterated vessel.

In vol. ix., p. 83, of the same *Transactions*, a very interesting case is related by Mr. Mayo, where an aneurism of the arch of the aorta was found to be far advanced towards consolidation, in consequence of the impaction of clot in the main artery. The tube of the aorta was completely closed by this impacted clot, so that not even air would pass up the vessel. This impaction occurred at the usual situation of the congenital malformation; but the clot, though adherent, could still be detached from the wall of the vessel, showing that the obstruction did not arise from that cause. The aneurism was situated below the three great branches, and the enlarged condition of these arteries seemed to be a step in the formation of the collateral circulation. Death was caused by obstruction to respiration produced by pressure on the lung and trachea. Exposure to vicissitudes of temperature, and habits of intoxication, appear to have had a great share in rendering this obstruction fatal. If the man's habits had been different, Mr. Mayo conjectures with reason, that the aneurism, which was found quite filled with firm coagulum, might have been spontaneously and permanently cured.

Many recorded cases show the severe symptoms which are produced by the distal impaction of clot in cases of aneurism, and the rapid and extensive coagulation which occurs in the aneurismal tumour. Let me call your attention, as an example of this, to a preparation and drawing (from the Irish College of Surgeons) from a case under the care of Dr. Stannus Hughes. I regret that time does not allow me to quote the whole of the very interesting notes which Dr. Hughes has sent me of this case, but I hope they will be fully published elsewhere. Suffice it to say that the patient was a gentleman past middle life, of a gouty habit, who had long laboured under a pulsating tumour, the origin of which, whether from the aorta or one of its great branches, was obscure. He had much improved in health under treatment, and one day after breakfast was about to go out for a drive, having just said that he felt lighter and better in health than for years past, when suddenly he gave a loud cry, exclaiming that he had an excruciating pain in the chest, and felt so cold that he asked to be laid on the hearth-rug before the fire. Dr. Hughes happened to come in at the time, and found the patient in an agony of pain, pointing to the sternum as the seat of it. In a few minutes this pain disappeared, but he was immediately seized with terrible convulsions, in which he died in a few seconds. The dilated aorta and the left ventricle of the heart were found full of recent coagula. The valves were healthy.

We cannot hesitate to attribute these terrible symptoms to the sudden coagulation of the blood in the arterial dilatation, and the intense pain to the stretching of its coats and the resistance offered to the heart's impulse; and many other cases, to which I could give references if time permitted, show the acute symptoms produced by obliteration of a large vessel with impacted clot, and the rapid collection of blood coagulum which follows on such impaction.

There is, then, sufficient pathological evidence to show that an innominate aneurism may be obliterated by the obstruction of its two distal orifices, and to prove generally that the obstruction of an artery as it leaves an aneurismal sac will in all probability be followed by a deposition of firm laminated coagulum in the portion of the sac connected with the obstructed artery, whereby the growth of the tumour in that direction will be stopped. Now, we must always bear in mind that it is not usually the existence of an aneurism, however large, which is dangerous to life, but the growth of an aneurism, however small, in some definite direction. To stop the growth of a small innominate aneurism towards the trachea, or of a small aortic aneurism towards the recurrent laryngeal nerve, would preserve the patient from a danger which cannot be over-estimated, and would be worth much more risk than is involved in tying the common carotid or the subclavian artery. Again, to line any portion of the sac of an aneurism where it is growing and threatening to burst, or compress important parts, is surely a reasonable object for an operation, even if the operation involves danger, and if the rest of the sac remains unconsolidated.

In combating Mr. Wardrop's proposal for reviving the distal operation, Mr. Guthrie endeavoured to show, from the preparations preserved in our museum, that the distal obliteration of an artery would not cure an aneurism, and I think I ought not to pass over so important an argument, although the data on which it rests are not very extensive. It will be noticed that even in advancing this argument Mr. Guthrie is obliged to admit that such distal impaction is an effort of nature to cure the disease; that is to say, that the disease is partly cured by it, though he did not believe that it could be so entirely.

In treating of the spontaneous cure of aneurism, Mr. Guthrie speaks as follows:—"Two natural processes favouring the cure of aneurism by coagulation have been observed to take place. The first is the enlargement of the collateral branches to such an extent as to enable them to maintain the circulation if the main trunk be rendered impervious. The second is the effort made to close or shut up the lower openings from the aneurism, or those most distant from the heart—an effort which has been hitherto scarcely considered as a natural one, but which is frequently attempted, and often with success." In a further passage he says: "The Hunterian collection supplies several instances of all the openings into an aneurism save the upper one having been closed during life, and I think in sufficient number to establish the fact, that in aneurism of the extremities nature resorts to this method as a part of the curative process; and although she succeeds in effecting it, still more is requisite to complete the cure by the filling up and obliteration of the tumour. These preparations also show, that when the lower end of the artery has been obliterated the aneurism has not ceased to increase. It is a step which, when once taken, favours the coagulation of the blood; and if a piece of coagulum be separated by accidental violence, or other irregularity committed on it by the patient, or by a state of syncope supervening, or by any other means, the coagulation of the whole of the fluid blood in the tumour may rapidly take place."

The preparations he refers to were numbered in the old catalogue 886, 892, and 397, and are at present numbered 1692, 1709, and 1703. Of the last preparation it will be sufficient to say that Mr. Guthrie clearly misunderstood the description which Hunter gave of it, in consequence of that description being, like so many of Hunter's, merely a short note or heading. His meaning was that the injection did not run through the sac into the artery in consequence of that part of the sac which lies next the artery being filled with clot. But a glance at the preparation shows that there is no obliteration of the lower end of the artery whatever. The bougie placed in it shows it opening freely into the dilatation which is part of the sac. I understand Hunter to have meant (as, indeed, the preparation shows to be the case) that cure had commenced by coagulum forming a barrier between the large sac and the small dilatation behind, which is part of the artery. No. 1709 (formerly 892) has been re-examined, and it is found that the artery, though nearly, is not quite obliterated. Thus, as the process is not complete, we can hardly speculate on its effect, even if the condition of the preparation was such as to admit of a decision on this point, which, however, it is not. The other preparation, No. 1692, in no respect answers to Mr. Guthrie's descriptions as one in which all the openings into an aneurism save the upper one have been closed during life. A slight error is made in the old catalogue, where the obliterated artery is called the brachial, and the aneurism is described as axillary. In fact the artery is the axillary, and the aneurism affected the subclavian, commencing near the point at which the thyroid axis is given off. So that there would be a constant current in the aneurism through the large branches of the subclavian and axillary for anything that this preparation shows. Here, again, only a fragment of the aneurism has been preserved, so that it is impossible to say exactly what effect was produced on the tumour by the obliteration of the axillary; much clot has certainly been deposited in it. But while large branches are left (as was probably the case in this instance) opening out of the sac, it is likely enough that the impaction of clot in even the distal portion of the trunk itself will not cure the aneurism. Even so, however, it may lead to considerable deposition of clot, and may obliterate some part of the tumour, which otherwise would have grown, and possibly burst.

Mr. Guthrie has endeavoured to show that in the cases where Brasdor's operation has proved successful (and that it has been entirely successful in some cases he does not deny, nor that it has in others been partially so), this success has been produced by inflammation propagated from the seat of ligature to the artery, and thence to the walls of the sac. How far Mr. Guthrie would have modified his opinion had the phenomena of impaction of clot in vessels and its results been more fully known to him I cannot say; but I think that anyone who studies his lectures with attention will be of opinion that in this particular his judgment was somewhat misled. It is true that he brought forward the case of Hall, operated on by Mr. Evans of Belper, and that of the negro operated on by Mr. Montgomery, and succeeded in showing that in both cases inflammation and suppuration in the tumour had followed on the operation. But in Hall's case this inflammation was caused clearly enough by imprudent exposure to accidents in riding and to intoxication after the immediate results of the operation had long passed away; and though the same cannot be said in Montgomery's case, yet suppuration in the sac follows occasionally after the Hunterian as well as after all other modes of treating aneurism, apparently as the result rather of imperfect coagulation within the aneurism than of inflammation of its parietes. Very probably this is more likely to happen after the distal than the proximal ligature, as it certainly seems to be after Anel's than after Hunter's method; but I confess that I fail to see the radical difference on which Mr. Guthrie so much insists. On the contrary, it seems clear that the coagulation in the sac has been more extensive and complete in cases where no inflammatory symptoms have been recorded.

I conclude therefore that there is *a priori* reason to believe that Brasdor's operation may be successfully applied to some cases of aneurism of the innominate artery, and that when applied to aortic aneurisms it may possibly be followed by partial consolidation of the tumour.

The conclusions on the subject of Brasdor's operation in innominate aneurism, which are justified by present experience, appear to me to be as follows:—

1. That the distal ligature of the carotid alone, or in conjunction with that of the third part of the subclavian, cannot be trusted to produce the complete consolidation of the tumour.
2. That, however, the natural effect of the ligature of the carotid artery is to produce coagulation in the part of the sac directly connected with the mouth of that artery.
3. That this may suffice practically for the cure of the aneurism, when the subclavian portion of the sac is small and shows no disposition to grow.
4. That in other cases, where the mouth of the subclavian artery is previously obliterated by impacted clot, the ligature of the carotid only may effect a radical cure.
5. That for these reasons it is better, in any case which appears to require distal ligature, to commence with the operation on the carotid alone, and afterwards to consider the propriety of securing the subclavian either in its first or third part.

With respect to the justifiability of the operation on the first part of the subclavian artery, I beg to submit the following considerations bearing on the question whether it is possible to avoid in future the occurrence of secondary hemorrhage after the ligature of a large artery. The subject is a new one comparatively; and I must be understood as speaking with all possible reserve on a point where our present experience does not permit us to dogmatise.

In determining the justifiability of repeating an operation which has hitherto never succeeded, the reason of that want of success is, of course, the first subject for our consideration. The ligature of the first part of the subclavian has hitherto failed on account of the almost uniform occurrence of secondary hemorrhage. There are, it is true, anatomical difficulties and dangers in the operation. In tying this artery for innominate aneurism there would be much risk, in some cases, of wounding or injuring the sac; in others, of finding the vessel diseased and somewhat aneurismal. Still I think most surgeons would allow that, if we could be sure that the ligature of a large artery involved little or no risk of secondary hemorrhage, the operation might be repeated under similar indications to those which would justify any other operation of equal gravity.

Now, an audience such as this need not be reminded that the ligature of an artery, without its subsequent division, has been an object which has been pursued by surgeons ever since the very first case in which John Hunter tied the femoral for popliteal aneurism.

In one of the earliest cases operated on by Mr. Cline, the attempt was made, by means of a temporary ligature, to produce pressure enough to close the vessel, but without dividing it by ulceration. The same attempt has been frequently repeated, but it does not seem that the usual way of making the attempt is a safe one. This consists in laying on the artery a substance (such as a plug of lint), over which the ligature is tied, and then cutting the knot of the ligature at such a time after the operation as in the judgment of the surgeon is sufficient to ensure coagulation in the tube of the vessel without producing enough irritation in its coats to destroy their vitality. As this plan has been sufficiently tested, and is allowed to be more dangerous than the common single tight silk ligature, nothing further need be said about it. But the same object has been sought by temporary deligation, or acupressure of the artery—*i. e.*, by compressing it with some metallic substance, which is removed when it is judged safe to do so. Allow me to exhibit this specimen, lent to us by the Royal College of Surgeons in Ireland, and showing the obliteration of the femoral by means of the presse-artère, and the cure of the popliteal aneurism, for which the operation was performed. The presse-artères which have been introduced hitherto do not seem trustworthy; still this preparation shows that an artery may be obliterated, and an aneurism cured without division of the vessel.

I would refer also to a very interesting case in which my friend Mr. W. Stokes used acupressure or temporary deligation to the abdominal aorta for the treatment of ilio-femoral aneurism, by a wire compressor invented by Mr. Porter. The patient only survived the operation twelve hours, his death being referred to the shock of the operation on a weak fatty heart. The aorta, though held tightly enough to prevent the passage of any water injected into its upper end, showed no trace of injury to any of its coats. In the case, however, in which Mr. Porter performed a similar operation on the innominate for the treatment of subclavian aneurism, by means of an instrument something like a small lithotrite, after three days of pressure the coats of the artery sloughed and fatal hemorrhage resulted, and when the pressure was removed the pulsation of the tumour recurred. This very valuable and interesting preparation I am also enabled to produce through the courtesy of the College of Surgeons in Ireland. Mr. Porter was of opinion that in this case failure may have been due inpart to the comparative clumsiness of the instruments, and has figured in his "Surgical Reports" the more manageable and delicate form of instrument which Mr. Stokes used. The time during which Mr. Stokes's patient survived hardly allows a judgment as to the action of the compressor.

Sir P. Crampton, in the seventh volume of the *Medico-Chirurgical Transactions*, argues that the division of the two internal coats of the artery is unnecessary; and he recommends that the walls of the vessel should be brought into contact by means of a loop, whose tension is to be regulated by a presse-artère with just sufficient force to stop the pulsation of the aneurism—the ligature to be removed as soon as, by experiment, it is found safe to do so. Two examples of the successful use of this plan are given, and it has been imitated by various surgeons, while others have invented processes of their own essentially similar. But it has been found that the proceeding is so uncertain, the injury done to the artery so difficult to estimate, and the withdrawal of the ligature, therefore, so likely to provoke secondary hemorrhage, that it is wellnigh abandoned. Mr. Bickersteth, however, a short time since, used a plan of the kind on the innominate artery.

Since the use of silver sutures has become general, and the absence of ulceration has been noticed which sometimes attends on their remaining, even for a great length of time, buried in the body, it has been attempted to ensure the same absence of ulceration by tying arteries with ligatures of this substance. But many cases have been put on record showing the uncertainty of this proceeding. The only thoroughly satisfactory case which I am acquainted with, in which the silver ligature has been used to a large artery, was one that occurred in my own practice, and in which I tied the femoral artery for popliteal aneurism. The wound healed, though not without suppuration, in less than a fortnight. No trace was ever seen of the ligature, and the man recovered rapidly and completely. He is, I believe, still alive, and was in good health I know a short time ago. In this case a most careful watch was kept for the appearance of the ligature if it should come away; but nothing was seen of it, and I believe that it buried itself in the tissues of the vessel, and in all probability without dividing the continuity of the latter. In an operation on the carotid of an ass, I found the artery undivided and obliterated six weeks after the application of a silver ligature. The ligature still surrounded the artery loosely. But this substance is, I think, a somewhat dangerous one, for if it is tied at all tightly it will cut the coats of the vessel more deeply, and I believe produce more and more rapid ulceration than the silk thread does. Such was the case in this preparation, taken from a patient in whom Mr. Brodhurst tied the femoral with silver wire. In this other instance of ligature of the external iliac by Mr. Pollock the patient died from another cause before the effect of the ligature could be ascertained.

From what I have seen and read, then, of the effect of the silver ligature to an artery, I conclude that its use will, in some cases, probably preclude the occurrence of secondary hemorrhage, but that it is too uncertain in this respect to be preferable to silk.

A far more reliable material is catgut, and I hope to show you anatomical proof that this substance, when properly prepared, may be used for the ligature of a large artery with perfect success, and without dividing the external coat of the vessel, or interrupting its continuity, while the ligature itself is absorbed; and also to adduce practical proof that the wounds made over vessels so tied often unite by first intention. But I would wish to impress on you the conviction that I entertain, that in such cases it is not merely the material used for the ligature which is of importance, but that the rapid union of the deep parts of the wound is also a necessary condition.

The catgut ligature, for the purpose of securing a large artery, was first proposed, I believe, by Sir A. Cooper, and he carried out his own proposal in a case in every way so remarkable that it is astonishing to find it attract so little notice or imitation. In 1817 Sir A. Cooper thus wrote:—"My friend, Mr. Lawrence, has proposed that the silk usually employed for ligatures should be cut off close to the knot, so as to heal the wound over it. It has occurred to me that catgut would answer the purpose better, and I shall give the result of the trial I have made, wishing it to be understood that I consider the subject at present as undecided, and only as one for future investigation. Catgut employed as a ligature, being more of the nature of the animal matter in which it is embedded, will be more easily absorbed than silk; or even if not absorbed, will be less likely to excite irritation in the parts." He then proceeds to relate the case of a man, aged eighty, who came under treatment at Guy's Hospital on the 15th of October, 1817, for popliteal aneurism, and in whom he tied the femoral artery on the 24th of October with "a single ligature applied round the artery, both ends of which were cut off close, and the edges of the wound brought together by adhesive plaster; the substance made use of for the ligature was catgut which had been previously soaked in water about the temperature of 100°." The wound was not again inspected till the fourth day (October 28th), when it was found "*completely* united;" and on the 7th of November it is noted, "The wound remains perfectly united and free from irritation." Again, on the 24th of November, "No appearance of irritation from the ligature." "In three weeks after the operation he walked in the ward with the aid of a crutch." The notes are continued down to the 17th of December, when, it is said, "His health is perfectly good, he walks without the aid of crutch or stick, the swelling is reduced to a small size, and the part at which the incision was made has been and now is quite free from irritation." No wonder that a result so unusual, or rather so unprecedented, to the operation for popliteal aneurism, drew from Sir A. Cooper the following remarks:—"I confess that this case gave me much pleasure. The great age of the patient, the simplicity of the operation, the absence of constitutional irritation, and, consequently, of danger, and his rapid recovery, lead me to hope that the operation for aneurism may become at some future period infinitely more simple than it has been rendered to the present moment."

Sir Astley's subsequent experience was, however, disappointing. In the 12mo edition of his Lectures, 1829, p. 168, is as follows:—"I thought that a ligature made of catgut would admit of solution, and I tried it on a man eighty years of age, on whom I performed the operation for popliteal aneurism; the catgut ligature was cut down to the vessel, the wound healed over, and no bad symptom followed. The experiment succeeded, it is true, in this case, but I have used the catgut ligature in three cases since, and did not find it at all superior to the common ligature; in each of the three it came away by suppuration and ulceration as in common cases; it did not, therefore, succeed. In the old person there was less tendency to inflammation, and that was the reason of its succeeding. I made some experiments on dogs to ascertain the solubility of catgut. I tied the carotid of a dog with catgut ligature; in a fortnight after

I killed the animal, and found that the ligature had not been dissolved, but that it had cut through the artery, and was situated in a cyst, like that which is formed round a ball, between the divided ends of the vessel, in a quiescent state. Therefore, this substance does not admit of solubility, but will remain sometimes without producing irritation. On the whole, catgut ligatures are not at all superior to the common ones. Some animal matter of the form of gluten made into ligature might do, but this is mere conjecture. At present there is no ligature known which is capable of being dissolved and removed by the absorbents."

In *Cooper's Surgical Dictionary* (art. Ligature) may be found an account of what has been done down to recent times in experiments on animal ligatures. Those introduced into practice by Dr. Physick, in 1814, were made of chamois leather, and the same substance was made use of by Dr. Jamieson, of Baltimore, who "tied the carotid, the iliac, the femoral, the radial, the posterior tibial, the spermatic, and other arteries with 'buckskin ligature,' and in no instance had secondary hemorrhage occurred; and he states that he has never seen anything of his ligatures, and of course the wounds have generally healed by first intention." The quotation is from the American edition of *Cooper's Dictionary*.

Porta's experience in tying arteries in the human subject with catgut is the most considerable hitherto published. His work gives short notes of nine cases in which the operation was performed by himself, and two in which Guerini was the operator, assisted by him. The arteries were the carotid, femoral, and brachial, each three times, the external iliac and the posterior tibial. In none of these cases was there any secondary hemorrhage; and the results were certainly as satisfactory as those of the ordinary ligature. But I do not see that Porta's practice afforded any conclusive proof of the superiority of catgut as the material for ligature. In the first case (carotid) the patient did well, but the wound took two months to unite. In the second (brachial), the patient died, sixty-five days after the operation, of pneumonia (pyæmic). The wound had suppurated up to the time of his death, but this suppuration was proved to be only superficial on post-mortem examination. In the third (femoral) the patient died of gangrene in seventeen days; the wound suppurating up to the date of death. In the fourth (carotid) the wound healed soundly and permanently in four days. In the fifth (femoral) the patient died in fifty-five hours. In the sixth (femoral) the patient died on the tenth day of encephalitis. The external wound had healed, but there was a small abscess below the fascia lata, not, however, in contact with the artery. In the seventh (carotid) the patient died in forty hours. In the eighth (external iliac) the patient died on the third day of encephalitis. In the ninth (brachial) the wound was not closed for a month. In the tenth (brachial) the wound did not close for five weeks. In the eleventh (posterior tibial) there was a large wound caused by laying open a traumatic aneurism in the foot. It closed in about six weeks. In none of these cases was the ligature observed to come away, but in all those examined after death, when a sufficient time had elapsed, the vessel was found to have been divided.

It will thus be seen that none of the cases pursued a course remarkably different from the usual one, except the fourth case, in which the wound of ligature of the carotid healed permanently in four days. This is a gratifying result of operating with close-cut ligatures; but it does not, by itself, prove anything as to the catgut ligature, since a similar result has been obtained with silk, as the following quotation from Porta shows—"In Wright's patient, who died five months after the operation on the external iliac, the silk ligature, which had been buried in the wound, was found, on dissection, lying close to the artery enclosed in a small cyst, something like an inguinal gland."

Knight relates that Lizars tied the subclavian for axillary aneurism, April 26, 1834, on a patient named Hain, with a flax thread, the ends of which were cut short, and the wound was united; the latter healed entirely on the third day, and the patient recovered completely, nothing more being seen of the ligature.

Porta, however, though he strongly recommends catgut as a material for ligature, nowhere, as far as I see, contemplates the occlusion of the vessel without its division: and, speaking of secondary hemorrhage, he says (p. 133): "Hemorrhage being inherent in the nature of the operation and of the organ operated on, and the condition being far more propitious to it in the human subject, we must not flatter ourselves that we shall ever be able to annihilate its possibility by any method, or to reduce it within the limits which we observe in the lower animals."

Mr. Normal, of Bath, also tied the femoral artery with catgut, cut short, March 7th, 1818. The case was successful; but the wound, which "appeared at first to have united in two days, separated. A long and troublesome suppuration ensued, and the wound was not healed till the latter end of April. The ligature was never seen to come away."

Sir P. Crampton also used a ligature of moistened catgut in tying the common iliac artery in the year 1828. The ligature was not cut close; it came away on the eighth day, and the patient at the same time complained of very severe pain. He died of a sudden gush of hemorrhage, from the upper end of the artery, in less than a minute, on the tenth day—*i.e.*, two days after the fall of the ligature. Pulsation had been perceptible in the tumour from the fiftieth hour after the operation, and had so far increased as to justify the suspicion than the ligature had softened and given way. The note on the day on which the ligature came away runs as follows:—"Has the blood returned by the free anastomosis between the internal iliacs?—or has the catgut ligature become macerated and given way? The pulsation is stronger than could be expected if the tumour were supplied only by the collateral source of anastomosis. The prevalent opinion, therefore, was that the ligature had given way." This opinion was strengthened by the appearances found on post-mortem examination. The artery was not cut through; but its internal and middle coats were completely divided, and there was an opening in it (not described in Sir P. Crampton's account) from which air or water injected into the proximal end of the vessel issued. This opening communicated with an abscess surrounding the artery, and thus a way was afforded for the blood from the artery to the wound.

Now on this case I would remark—1. Had the ligature been properly prepared, it would have held the walls of the vessel together, and prevented circulation through it until its divided internal coats had been sufficiently united to resist the impact of the blood. As it was, the artery, weakened by the violence done to it, and the division of a great part of its wall, was doubtless torn by the distension which a great stream of blood caused in passing through it. 2. Or, if the parts around the vessel had become firmly consolidated and united in the first few hours after the operation, they might have answered the same purpose. This seems to have happened with the carotid artery in my case of double distal ligature. Two small depressions are seen close to the track of the ligature, on the inner face of the vessel. One does not lead outside the tube of the artery; but the other leads into a small sac (formed out of the cellular tissue, or by the expanded external coat of the artery), and containing a little old blood-clot. If the formation of this little sac had been interfered with by suppuration around the artery, very probably the minute opening might have enlarged and hemorrhage supervened. If Sir P. Crampton had prepared the catgut properly, had tied the ligature firmly, cut it off correctly (both ends close), and had so treated the wound and the patient as to produce speedy consolidation of the deep parts, there would probably have been no hemorrhage.

In a case recently under my own care the patient died on the twenty-seventh day after amputation of the forearm, of chronic pyæmia, which was, as I suspect, developed before the operation. The stump was healed all but a small opening which led into an abscess, holding about two drachms of foul pus. No trace was found of any of the catgut ligatures which had been applied. These were at least four in number—on the radial, ulnar, and interosseous. Some other arteries might have been tied, but no particular note has been preserved of this. One of the larger arteries, having been divided obliquely, required two ligatures. There was no trace of any irritation around the part where these ligatures had been applied, nor any pocketing of the matter, or attempt at formation of a cyst. The existence of an abscess in the stump was due evidently to failure in vital power. During the first fortnight the stump had healed with great rapidity; but afterwards, as the patient's powers failed, the closing of the wound was suspended, and the matter became foul. As I always dressed the stump myself, I think I can be certain that the catgut never came away. Besides, in a great part of the stump the edges had healed by first intention, and several of the sutures, which were also of catgut, had never been removed. They had been left to themselves, the part below the skin melting away, and the exposed part dropping off, when this process was complete. [I produce the arteries from this case.]

This is the only opportunity I have yet had of examining the site of an operation of any magnitude at a time which would test the disappearance of the catgut ligatures, except in one other amputation (of the thigh), in which the patient died about the sixth day. The catgut ligature on the femoral artery was found much softened and absorbed, so as to be quite relaxed, and to be drawn off the artery with perfect ease. No secondary hemorrhage had taken place, but there was not much coagulum in the vessel, and I am not certain that secondary hemorrhage would not have occurred had the patient survived. This case, however, happened very early in my use of the catgut ligature, and I doubt whether the gut was properly prepared. It quite coincided with the former case in showing the reality of the absorption of the catgut when buried in the tissues.

Another obvious proof of this same absorption is the fact noticed by Professor Lister, and which I have over and over again verified—viz., that when this same material is used as a suture for a wound, if it be withdrawn in a few days, the part which has been buried below the wound is reduced in volume to a fine thread, its tenuity depending of course on the length of time it has been buried; until, as I mentioned in my case of forearm amputation, the deep part of the suture melts away, and its superficial part drops off. Thus an incidental advantage in these sutures is that they do not require to be withdrawn. Further, the absorption of the catgut ligature is proved by the occurrence of primary union over it, of which I have had at least one very striking instance in my own practice: In a case which occurred some years ago I removed the breast and some axillary glands affected with scirrhus by an incision more than six inches in length. The whole wound united by first intention over the catgut ligatures, several of which had been employed. I kept the woman in hospital for a time to see whether any irritation was set up by the buried ligatures. But nothing of the kind took place; and I saw her again long after, and ascertained that no irritation, far less any abscess, had ever existed in the neighbourhood of the wound. I mention this case especially on account of the opportunity I had of seeing the patient long after the healing of the wound.

But since the employment of this material primary union after ligature of a large vessel has become extremely common. Thus Mr. Bickersteth says: "During the last three years I have tied the femoral artery five times, the common carotid once, and the common iliac once; and in every case, with one solitary exception, the wound has healed at once, and without suppuration."

In the case in which Mr. Heath lately tied the left carotid on the distal side of an aortic aneurism with carbolised catgut cut short, the wound was not looked at till the eighth day, when it was found to be entirely healed by the first intention. The man is at present in our hall, and you can see after the lecture how simple and perfect the union of the wound has been.

In Professor Lister's well-known tract *On Ligature of Arteries on the Antiseptic System*, he produces evidence which in his belief justifies the following opinion:—"It appears, then, that by applying a ligature of animal tissue antiseptically upon an artery, whether tightly or gently, we virtually surround it with a ring of living tissue, and strengthen the vessel where we obstruct it. The surgeon, therefore, may now tie an arterial trunk in its continuity close to a large branch, secure alike against secondary hemorrhage and deep-seated suppuration, provided always that he has so studied the principles of the antiseptic system, and so carefully considered the details of the mode of dressing best adapted to the particular case in hand, that he can feel certain of avoiding putrefaction in the wound. For my own part, I should now without hesitation undertake ligature of the innominate, believing that it would prove a very safe procedure."

Now, I have purposely avoided speaking about the principles of the "antiseptic system" as laid down by Professor Lister,—not that I do not recognise the great interest of the question, but because I have neither the time nor the materials required for its adequate discussion. But I will not refrain from saying, that whether Mr. Lister's explanation of his method of dressing wounds be or be not the correct one, that method is very frequently (I will not say uniformly) successful in producing rapid union, especially in the deep parts of the wound; and if this be granted, which I think no surgeon will deny who will trouble himself to obtain practical experience of wounds so treated; and if it be also granted (which cannot be denied, for it is a matter of demonstration) that the catgut ligature, under favourable circumstances, will gradually melt away in the tissue without setting up ulceration—how can it be denied that an artery tied with this substance, and so treated as that the deep parts of the wound may rapidly consolidate, has a chance of that union by first intention which John Hunter and his followers sought after? Such rapid union is impossible in the ordinary method, where a silk thread is keeping up irritation and ulceration in and around the tied artery, and propagating inflammation from the bottom to the surface of the wound.

In my own case of double distal ligature, the wounds were not treated in any special manner. I did, indeed, dress them immediately after operation in the manner recommended by Mr. Lister; but as the man's restlessness during the ensuing night disarranged all the dressings, and the air had been freely admitted to the wounds for many hours before I saw him next day, I discontinued these dressings and applied merely wet rags. The exact condition of the tied arteries is shown in the preparation and in the drawings before you. You will notice that the carotid artery was obstructed only by a small quantity of clot, which has fallen out of the vessel in making the section. That the obstruction, however, was really complete during life was proved by the fact that only the faintest pulse was at any time perceptible in the temporal artery, and none at all for a calendar month after the operation; so that there could have been no premature softening of the ligature and reopening of the channel of the artery, such as occurred in Sir P. Crampton's case, and in a case where Mr. Spence tied the carotid; and there can be no doubt, I think, that, had the man lived a little longer, a permanent diaphragm would have replaced the clot in the carotid, and its condition would then have resembled that of the subclavian. The latter vessel is closed entirely by an obstructing material, or diaphragm, which is accurately represented in this drawing, and which to the naked eye resembles a fibrous material, but which I have not had examined with the microscope, in order not to interfere with the exact condition of the artery. The diaphragm seems not to be more than about a quarter of an inch in thickness.

This case then affords definite anatomical proof of that which we might have inferred from the experience above referred to of Mr. Lister, Mr. Bickersteth, Mr. Heath, and myself—namely, that it is possible to tie a large artery in the human subject in such a manner that the wound may unite by first intention, and the patient never be in any danger of secondary hemorrhage. And my case shows further, what no experience unconfirmed by dissection could show, that the catgut ligature may be removed by absorption, the vessel remaining undivided.

Now in this latter particular, our experience differs from that of Porta. He, as is well known, instituted most laborious experiments on the action of the catgut ligature in the lower animals, besides practising the operation on the human subject to which I have referred; and he came to the conclusion that in all cases a ligature, of whatever kind, tied tightly round an artery, produces a softening of its cellular (or external) coat, and the division of the vessel by a process which he distinguishes from one of ulceration, though the nature of the distinction is not made clear. The exact nature of the process, however, is immaterial to our present purpose. The only point of importance is that in Porta's operation the arteries were always divided, and when divided secondary hemorrhage is of course probable. In my operation they are seen to be undivided, and this is, I believe, the rule when arteries are tied in this manner. Now if the external coat remain undivided, secondary hemorrhage is only possible in case of such small apertures as the carotid exhibited in my patient, and these can only give rise to hemorrhage when the tissues in the neighbourhood are suppurating. If the latter remain firmly consolidated the only result will be (as that preparation shows) the extravasation of a minute drop of blood.

The differences which exist between such operations as I have described with the carbolised catgut and those which are related in Porta's great work are obviously two—the different preparation of the catgut, and the more rapid union of the deep parts of the wound. With respect to the first particular, no material can be imagined better adapted for a ligature than catgut long steeped in carbolised oil; it is perfectly tough, perfectly flexible, and perfectly smooth. It excites no irritation, absorbs no putrescent fluid, and though it gradually melts away, yet holds the artery firmly enough to close its tube permanently. Having used it in all large operations for about two years I can testify to the latter fact, and I can say that I have never seen any sign of irritation produced by it, nor witnessed the escape of any of the little knots from the wound, and that I hold it to be a very much better and more convenient hæmostatic than torsion, and infinitely superior to acupressure. In fact, I have found it to possess all the comfort of the silk ligature without its disadvantages.

If catgut is imperfectly prepared, it has not all these good qualities. If it be softened too much (as may easily be done when it is steeped in water), it will relax, and not hold the vessel permanently closed. If it be too little softened (as may easily be done when moistened in the mouth), it is very probably too harsh and irritating, and may be absorbent.

But I do not imagine that catgut, or any other ligature, can be applied to an artery with perfect success, by which I mean, so as to close its tube yet not interrupt its continuity, unless the artery itself is kept as much as possible free from inflammation—that is, unless the tissues around become rapidly coagulated by first intention. An artery exposed in the middle of a suppurating cavity will, I believe, always soften and give way; and it was in all likelihood because they failed to secure this prompt union of the deep parts of the wound that Porta in most of his experiments and operations, and Sir A. Cooper in the operation which he performed after his first successful one, failed to obtain this perfect result. At any rate, the fact that such results are possible must have its bearing on the question whether Brasdor's operation in its integrity is, or is not, applicable in aneurism of the innominate artery. For I think we have in the facts I have produced ample evidence that if the carotid and first part of the subclavian are obliterated, the coagulation of the entire tumour is the natural result; while the ligature of the carotid and third part of the subclavian, though it may possibly produce a cure, connot be certainly trusted to do so.

In those aneurisms, then, of the innominate artery which appear to be advancing after the distal ligature of the carotid, the surgeon is justified, I think, in proposing to tie the subclavian in the first part of its course.—*Lancet, June* 8, *July* 13, *Aug.* 31, *and Sept.* 7, 1872, *pp.* 783, 85, 287, 325.

43.—ON THE TREATMENT OF ANEURISM.

By Thomas Bryant, Esq., Surgeon to Guy's Hospital.

[Up to the present time aneurisms have only been treated by arrest of the circulation in the vessel leading to the aneurism, (afferent vessel). There are some aneurisms, however, in which the afferent vessel is out of reach, and such cases have been hitherto incurable. It has, however, been discovered that to produce a firm coagulum in the sac, it suffices to arrest the circulation through the efferent vessel.

Before we pass on to consider what our art can do in such cases, let us stop briefly to see what is to be learned from the processes of nature herself; and, without going into details, I may state that sufficient evidence exists to justify Poland's assertion (*Guy's Hospital Reports*, 1871) that "indirect compression on the distal side of the sac—on the efferent vessel—has been met with as a spontaneous source of cure in some rare instances of aneurism of the subclavian artery." Hodgson's case of a soldier is the best one to illustrate this point. It was a case in which a large aneurism of the aorta coexisted with a small one of the subclavian artery, and the aortic aneurism had so compressed a portion of the subclavian artery beyond the subclavian aneurism as to have caused its obliteration. The small aneurism was nearly filled with layers of coagulum, and the subclavian artery, from the point where it emerged from this little sac, was completely filled with a firm ligamentous substance. You may accept this case, therefore, as a typical one of a natural cure of an aneurism by pressure upon the efferent artery; and you must have remarked that the cure had been effected by the same pathological process as has been recorded in all cases of cure by obstruction of the efferent—by the formation of clot in the aneurismal sac.

Let us now proceed, then, to see how the surgeon can imitate this natural cure; what hints we can glean from the contemplation of the fact that an aneurism can be cured by the occlusion of the efferent artery—for there is surely no reason why art should not imitate natural processes—why surgeons should not so assist nature to effect a cure—why, mechanically, the surgeon should not so apply pressure in one of its forms to the distal side of the aneurismal tumour as to close the efferent artery, and thus artificially cause the deposition of a fibrinous clot in the aneurismal sac similar to that already described to have been deposited by means of the accidental pressure of the subclavian artery beyond the subclavian aneurism; and I think I shall be well able to show you that such a result can be obtained. The first evidence I propose to adduce shall be a pathological one, the second clinical.

The pathological is represented by this preparation; a more beautiful and valuable one I do not know, for it shows as clearly as facts can show that an abdominal aneurism can be mechanically filled with clot, even to its occlusion, by means of mechanical pressure applied to the efferent vessel for only a few hours; and that such a clot seems to be as well formed and of a like nature to that deposited by the obstruction of the afferent artery. It suggests, also, a mode of treatment by which many aneurisms may be treated that are beyond the reach of other surgical means, and well supports the theory and practice which were suggested and applied by Brasdor and Wardrop—namely, the application of a ligature to the distal side of the aneurism.

The details of the case have been laid before the Medical and Chirurgical Society (April 8, 1872.) On the present occasion it will be enough for me to tell you that the aneurism was one of the cœliac axis, and that the consolidation you see in the sac was the consequence of pressure by means of Lister's abdominal tourniquet for sixteen hours, the man dying from peritonitis, the direct result of some contusion of the peritoneum from the pressure of the tourniquet.

I will now give an example of Wardrop's operation, or the application of a ligature to the subclavian artery for aneurism of the innominate, the carotid being left alone—Wardrop's operation consisting in the application of a ligature on the distal side of the aneurism, leaving a large arterial trunk between the aneurism and the point of ligature, whilst Brasdor's operation consists in the application of a ligature to the efferent artery itself beyond the aneurism, with no branch between. It was suggested by Brasdor, but first successfully applied by Wardrop to the carotid artery, and is doubtless a good operation. I shall give you some facts by-and-by to support this assertion.

Aneurism of the Innominate Artery—Ligature of Subclavian (Wardrop's Operation)—Recovery. [*Reported by Mr. E. Hicks.*]—James S., aged thirty-three, was admitted into Guy's Hospital, under Mr. Bryant's care, on August 7, 1871, with an aneurism of the innominate artery. He was a healthy carter, a resident of Bolton, Lancashire. He had always had good health, never having had syphilis or rheumatism. Eighteen months ago, when lifting a heavy box with his arms raised, and supporting it with his neck and shoulders, he felt a pain in the right side of his neck. He thought little of it; but within a few days he felt a pain in his right arm, and a sensation after using it as if his hand was asleep. He then observed a swelling above the right collar-bone, which pulsated. He went into the Manchester Infirmary for five months, and subsequently into the Bolton, where a weight of lead of about two pounds was fixed over the part. This did, however, he says, no good.

On admission, a soft expansive pulsating swelling, rising from behind the right sterno-clavicular joint, is to be seen. It clearly involves the sternum and sternal end of the clavicle. It runs well out of the chest, and pulsates freely. The patient has a slight cough, and at times difficulty of deglutition. There is no distinct aneurismal bruit. The second sound of the heart is very loud in the tumour. The right radial pulse is small. The man was ordered to keep his bed and to have ice applied to the tumour.

On August 19, Mr. Bryant applied a ligature to the right subclavian in the third part of its course—using a carbolised gut ligature. No difficulty was experienced in the operation; a large vein, which was wounded as it entered the internal jugular, was ligatured. The wound was closed and covered with lint soaked in the compound tincture of benzoin, cotton-wool covering the arm. He passed a good night after the operation. He has still a little cough. No rise in temperature.

August 22. Slight pulsation to be felt in right brachial artery; none in radial.

23rd. Slight bleeding took place in the wound, and again six hours later. It was stopped by ice.

24th. All the dressings were removed yesterday. Wound discharging (from the only spot that has not healed) some broken down blood. Ice to be kept on. The man says he feels quite well; takes food kindly.

25th. The wound discharges very little now. The tumour is certainly smaller and harder; it pulsates very feebly.

September 6th (seventeen days after the operation). A sphygmographic tracing was taken from the radial artery.

11th. The man was up, the parts having consolidated; wound healed. Tumour decidedly smaller and harder, and pulsating very feebly.

22nd. The man left the hospital convalescent. He was to return after the lapse of a few months to have the carotid ligatured should the aneurism have increased.

I must not, however, rest satisfied with the mere personal experience I have to give—it is good, there can be little doubt, and enough to warrant the inference that the forms of practice indicated are worthy of thought and of practical application; but I can back it up by some good recorded experience of others. I can refer you to a case of Edwards's, published in the *Lancet* for 1858, in which distal pressure was applied to the carotid and subclavian arteries of a lady, aged fifty, for aneurism of the innominate. It was applied by means of an instrument (for a description of which I must refer you to the original paper) kept on for three months; and at the end of that time the tumour, from having been the size of an apple, and soft, came to that of a nut, and hard, all pulsation in it having ceased with all other symptoms.

The case of aneurism appeared to have been cured by means of pressure applied to the efferent vessel.

I can tell you also that out of seven recorded examples of Brasdor's operation upon the carotid for carotid aneurism, four recovered—one of Wardrop's, one of Bush's, one of Wood's (of New York), and one of Colson's; out of three for carotid and innominate aneurism, one—Evans's case—was alive thirty-four years after; out of fourteen cases of ligature of the carotid on the distal side for innominate aneurism, five were cured—one of Wickham's, Fearn's, Scott's, and two of Pirogoff's; and of the two cases on record similar to that I have just recorded of my own, in which the subclavian was ligatured for innominate aneurism, one—Wardrop's case—was alive two years after, and Broca's survived six months.

I must tell you, however, that five out of six of the cases of simultaneous distal ligature of the subclavian and carotid arteries for innominate or aortic aneurism proved fatal, although Heath's case lived four years after the operation.

Now, I think you will agree with me that these facts, pathological as well as clinical, are enough to prove that the treatment by pressure, and, on this failing or being inapplicable, by ligature upon the efferent artery of an aneurism, is an operation which holds out very good hopes of securing a fair amount of success—of success, also, in a class of cases that, under other circumstances, must be left alone, for they are beyond the reach of the surgeon's art. I mean certain examples of abdominal aneurism and of aneurism of the innominate and first part of the subclavian and common carotid arteries. In aneurism of the common iliac and external iliac it may also be of value.

There is, however, one other point which the successful treatment by pressure upon the afferent and efferent artery of an aneurism brings prominently forward, and that is, the use of some other expedient by which the circulation in the vessel may be temporarily arrested; for although digital and instrumental pressure are good, they cannot always be employed, and it would be well if some other practice could be adopted which would act upon the same principle. John Hunter doubtless had this in mind when he adopted the practice of applying a temporary ligature to an artery for the cure of aneurism; and Sir A. Cooper and Mr. Travers tried to further it by some experiments upon animals. But the practice never found its place in surgery, and yet there must surely be something in it; for if by the mechanical pressure of a finger or instrument upon an artery leading to or from an aneurism the mechanical closure of that aneurism may be secured by means of coagulum, surely the same end may be as confidently looked for by the use of some temporary ligature or other occluding medium.

It is possible that in Lister's antiseptic catgut ligature this temporary occluding medium may be found; for by means of it it appears that an artery may be occluded as effectually as by any other ligature, and that, as the gut subsequently dissolves, no irritant is left around the artery to set up an ulcerative action for its discharge that may neutralise the good the application of the ligature had effected.

With the same object the artery constrictor I now hand round, of Dr. S. Fleet Speir, of New York, appears to me to possess a value of no little importance. I do not say that the instrument itself is perfect, for I do not think it is; but the principle upon which it acts is a good one, and worthy of adoption. The instrument with an essay obtained a prize from the Medical Society of New York in 1871 (*vide Medical Record*, New York, April 1, 1871). I have made many experiments with it on the dead subject, and find that it does all its inventor claims for it; it produces a division of the inner and middle coats of the artery and their valvular incurvation or invagination—in fact, doing for an artery in continuity what torsion does for a divided one. I have used it but once on the living subject—upon the brachial artery—and it answered well.

I cannot allow myself to say more upon this important point; but I feel strongly that if from the pressure of an artery—afferent or efferent—for only a few hours an aneurism may be cured, the same result may not unreasonably be looked for by the adoption of other temporary means of occluding a vessel, such as some temporary ligature, catgut or otherwise, or the application of some instrument like, or acting on the principle of, that of Dr. Speir; for I can well see that by the use of such an instrument or means many cases of aneurism are to be treated in which pressure cannot be employed, and the use of the permanent ligature which has to ulcerate through a vessel, and all its dangers, may be dispensed with altogether.

I believe that in this direction much will be done in the next few years, and I leave the thought to some of the active minds I see before me for future development.—*Medical Times and Gazette, July* 27, 1872, *p.* 87.

44.—A CASE OF POPLITEAL ANEURISM CURED BY PRESSURE.

By Dr. John K. Barton, Surgeon to the Adelaide Hospital, and Examiner in Surgery, Queen's University, Dublin.

In undertaking the cure of a popliteal aneurism by pressure, the object to be aimed at is not only the solidification of the tumour, but also to accomplish this (1) in the shortest possible time; (2) with the smallest possible suffering to the patient; and (3) without injury to the integument.

The plan adopted in the following case fulfilled these indications very well.

Iodide of potassium was given during the entire time of the treatment; how far this may have influenced the solidification of the tumour must remain very uncertain; but it is a curious fact that a drachm of this salt could be taken daily, for ten days, without producing any unpleasant symptoms.

The notes of the case were taken by Mr. Heath, resident pupil, who watched the case, and carried out the treatment with the greatest possible attention.

Thomas Latimar, a shoemaker, 32 years of age, presented himself at the Dispensary of the Adelaide Hospital, upon the morning of May 24, 1872, to obtain advice for a swelling in the ham of the left leg.

Dr. Ward having examined him, at once diagnosed the case one of popliteal aneurism, and sent him into hospital, where he was admitted under Dr. Barton's care. Upon examination, the following facts were noted: The patient is a slight well-formed man, of middle stature. In the left popliteal space a pulsating tumour can be felt, rounded in shape, and about the size of a hen's egg—the pulsation is very strong and distensile, being nearly as forcibly felt on either side as directly behind. Pressure on the femoral artery at once causes the pulsation in the tumour to stop. No bruit can be heard in the tumour; the posterior and anterior tibial arteries can be felt, same as those of the other limb. The tumour in the ham is painless, and the ordinary colour of the skin. A soft murmur can be heard, but indistinctly, accompanying the second sound of the heart; most audible at the base of the organ.

History.—Had rheumatic fever about ten years ago; was in hospital about eighteen months ago for dropsy following scarlatina; after recovering from which, suffered from palpitation of the heart. About six months ago, began to feel a stiffness of the left knee, and in a month from the time he first felt the stiffness, he noticed a tumour behind the knee, and at the same time experienced a dull aching pain about the knee, and great difficulty in fully straightening the limb, which felt most comfortable semi-flexed, and, as his trade allowed it, was usually kept in a bent position. This pain got better when the limb had been kept at rest for some time, but returned severely upon the patient indulging rather largely in porter, and subsequently, whenever stimulants were indulged in, the pain came back, and each time it returned it was more intense than before. He never received any hurt, wound, strain, or other injury to which he could refer the appearance of the tumour. There are cicatrices in the groin of a suppurating bubo, but no signs of syphilis. The patient has cramps in the calf of the leg frequently. The affected limb measured around the knee half an inch more than the other.

Saturday, May 25th. He was ordered to take three times a day twenty grains of iodide of potassium and one drachm of the syrup of the iodide of iron, and to remain strictly in bed; the hair was ordered to be shaved off from the left groin, and the skin in this region to be bathed several times a-day with spt. of camphor.

Monday, 27th. The following arrangements were made for applying pressure:—A Skey's tourniquet, adapted to press the artery as it crosses the ramus of the pubis. A clamp, invented by Dr. Barton for another case, was applied about the middle of the thigh to press the artery in Hunter's canal. The object of the second instrument was to relieve the groin occasionally, and when it became necessary to relax the pressure at the groin, still to command the circulation through the tumour. Several students volunteered to sit by the patient all day, and see that the pressure was steadily maintained.

The pad of Skey's tourniquet was screwed down, and the pressure commenced at 11.10 a.m. No pulsation whatever in the tumour; no pain complained of. At 1.15 the clamp was tightened, and the tourniquet loosened, as the pain of its pressure was much complained of. At 2.30 the tourniquet was re-adjusted, the clamp being painful. Patient complained of cramp in the calf of the leg, and shooting down to the foot. At 5.30 a hypodermic injection of one-fourth of a grain of morphia was given, with the effect of enabling the patient to bear the pressure without any complaint of pain up to five minutes of 11 o'clock p.m., when all pressure was removed for the night. Scarcely any pulsation was to be felt at this time in the tumour.

Tuesday, 28th, 9 a.m. Pulsation in the tumour distinct; but not at all so violent as before the treatment was began. Skey's tourniquet re-applied at 11.15; no pain complained of; all pulsation at once ceased in the tumour. Pressure by means of this instrument was kept up all day, the patient complaining of occasional pain, which was relieved by a re-adjustment of the pad. At 11 p.m. he complained of severe pains. The instrument was then loosened, and the tumour was found upon examination to remain quite pulseless. The instrument was, however, re-applied upon a new spot; it was left on all night, but became displaced during sleep, so that probably very little pressure was made during the night.

29th. Upon examination at 10 a.m., the instrument having been entirely removed for three hours, a slight thrill only could be felt in the tumour.

Under these circumstances, a weight of 3½ lbs. was adjusted so as to rest on the artery just before it crossed the pubis, and consequently a little above the spot pressed upon yesterday by the pad of the tourniquet—a bandage secured the weight in position. This was sufficient to arrest the circulation in the aneurism, for no thrill whatever could be felt after it was put on. The patient felt no pain from the pressure, a full or tense feeling in the calf of the leg being the only uneasiness complained of. He passed the day and following night without any re-adjustment of the weight being necessary.

30th. Upon removal of the weight this morning all pulsation in the tumour was found to have ceased. All pressure was now removed; a chloride of lime lotion was applied to the groin where the skin was discoloured and a little vesicle had formed.

The limb was kept at rest by means of a long outside splint. The clamp being put round the limb, but not tightened, but ready to be screwed tight if any pulsation returned in the tumour.

31st. The clamp had not to be tightened at all yesterday or last night—tumour remaining quite pulseless. The collateral circulation is well established, a large branch pulsating in the inside of the knee.

June 1st. Skin in the groin, which had suffered from the pressure, is fast recovering itself; tumour remains pulseless; foot and leg bandaged with pad of cotton wadding in popliteal space; and foot secured to end of bed to prevent motion; splint removed.

June 6th. Allowed up—not to walk—to go about in a wheeled chair.

Patient is well in every respect.

As seen by the above notes, 60 hours was the full time during which pressure was applied in this case. Of these 60 hours 24 only were occupied by firm pressure; the remaining 36 by a light pressure, sufficient to check circulation in the tumour, but not enough either to produce much pain or to endanger the integument. That the popliteal artery no longer conducts the blood to the leg is proved by the fact of the distinct enlargement of the collateral channels; and it, therefore, may be presumed that the pressure employed was sufficient to arrest the circulation through the vessel altogether.—*Dublin Journal of Medical Science, July*, 1872, *p.* 1.

ALIMENTARY CANAL.

45.—ON STRANGULATED HERNIA.

By Sir James Paget, Bart., F.R.S., Consulting Surgeon to St. Bartholomew's Hospital.

[Whilst on active duty at the hospital, Sir James Paget operated on about a hundred cases of strangulated hernia. The varieties of hernia, their complications, and the different conditions of people in whom they occur, make so great a variety of cases, that it would need a tabulation of at least a thousand to obtain conclusions of real value.]

Our first subject may be the grounds for determining whether a strangulated hernia, or one supposed to be so, is to be submitted to operation. Speaking generally, one may say that when in a case of hernia signs of strangulation are present, and reduction by the ordinary means cannot be accomplished, the operation for reduction should be at once performed. But then, what are the sufficient signs of strangulation, and what are the ordinary, or, better, the reasonable means for reduction without operation?

In all well-marked average cases, that is, in such as are neither slight nor very severe, neither (as some divide them) acute nor chronic, the following may be regarded as the signs of strangulation justifying operation. The hernia, usually reducible, or now first formed, cannot be reduced by reasonable means. If not recently formed, it is larger than usual, tense, firm, or even hard; without impulse, without resonance, painful, and tender on pressure, especially at its mouth and neck. The bowels do not act, though they may often be felt contracting, and may cause much colic and spasmodic pain, especially at the navel and the pit of the stomach. With this pain there is commonly some tenderness, with a feeling of tightness in the abdomen, especially about the navel, and between it and the seat of the hernia. The patient is often sick, vomiting nearly all the food and drink that he swallows, and besides, a quantity of gastric and biliary secretion, or of the contents of the small intestines more or less diluted. The pulse and respiration are usually quickened and rather feeble; the patient feels and looks restless, low, and miserable—or, as it is called, "anxious." He cannot sleep or eat; and the hands and feet are apt to become cold and shrunken and dusky.

Whenever all these things are observed, and when they remain after such reasonable attempts at reduction without operation as I will presently speak of, you may hold that the operation should be done without delay. Much more, if possible, should it be done if these things be all worse than I have described. When the integuments over the hernia are inflamed, thick, sodden, and ruddy, or emphysematous; when the whole abdomen is swollen, tense, and tender; when the vomit is just like the liquid fæces of the ileum; the pulse very rapid, feeble, and small; the skin cold and dusky and clammy; when the patient is dim in sense and mind, or in an anguish of misery with retching and hiccough; when all or the greater part of these elements of what the old writers call a *miserere* are combined; then, without trying any other method of reduction, you must instantly operate, though you may have only the slenderest hope of doing good, and a serious fear of seeming to do harm.

Thus far, one may speak very positively. In the cases which I have sketched, there are the sufficient signs of strangulation; and if the hernia cannot be safely reduced without operation, the operation must be done. But you will not see many cases without seeing some in which, although the hernia may be irreducible, yet the signs of strangulation are very slight, obscure, incomplete, or in some other way not sufficient to make it nearly certain that the operation is necessary. It is an easy rule for all these cases that, whenever you suspect that hernia is strangulated, you should operate. If you will follow this easy rule, you will do some very bad surgery; you will kill a few patients whose lives you ought to save; and you will make many ill for two or more weeks who might be well in as many days or hours. You must avoid the easy rule, and learn the hard one of discriminating the cases that require operation. You must learn to discriminate those on which the operation must be done at once, without any previous attempts at reduction, and those in which before operation one or more attempts at reduction should be made with chloroform or other helps. For the purpose of such discrimination, let it be your design, in each case of strangulated hernia, not to choose any measure for its reduction till you have fairly weighed the signs of strangulation of which I have spoken. For convenience of thinking, you may divide them into the local symptoms, including all the characters of the hernia itself, and the less or more remote or general symptoms, especially the inactive bowels, the state of the abdomen, the vomiting, the pulse and respiration, and the general condition. I will try to tell how each of these, in its several degrees, may be estimated.

1. First, of the local symptoms, the irreducibility of the hernia, its unusual size, its tension or hardness, and the others which I enumerated, a few rules may include all that I can tell of these. It will be convenient to speak of irre-

ducibility last; for, though it may seem as if it should be the condition decisive for operation, it is really a fallacious sign of strangulation; and in some instances, no trial should be made to test its existence. As for the other local symptoms, their presence, in even a marked degree, is not decisive of strangulation, and is not sufficient to prove the need of operating when the remoter signs are not present. For the local symptoms may be found when a hernia, or its sac, is acutely inflamed, though not strangulated. In this state, which may follow injury, or even arise spontaneously, a hernia may become quickly larger than ever, firm and very tense, without impulse, very painful and tender, hot and red, and not at once reducible, by any fair means. The sac may suppurate, the integuments may slough; and yet there may be no strangulation and no need of an operation. I have, indeed, only once seen this sloughing of the integuments over a hernia; but the case is not likely to be without parallel, and was a glaring instance of the fallacy of the local signs of strangulation.

A very stout elderly lady had a large umbilical hernia, which became painful, tender, and irreducible; her bowels did not act, and she felt sick, but did not vomit. There appeared no urgent need for operation, and she was one in whom an operation was not to be undertaken lightly. But, after three days' watching, during which the local, but not the remoter, signs had somewhat increased in severity, I found that a large portion of the thin integuments covering the hernia had rapidly sloughed. I operated at once, though with little hope of doing good; for I supposed that the contents of the sac must also have at least partially perished. But they were not even severely strangulated; the mouth of the sac was too small for their return, but they were not tightly girt, and the intestine was only moderately congested. The sloughing of the integuments seemed due to inflammation in a very feeble person, and an ill-nourished part; and with the same feebleness the patient died on the day after the operation.

You may find, then, and not rarely, that the local characters usually present in a strangulated hernia may be imitated in an inflamed hernia which is not strangulated. And, though very rarely, many of the remoter signs—the constipation and the vomiting, the quickened pulse and breathing, and the rest—may exist when a hernia is inflamed, but not strangulated. How, then, can you discriminate? Generally thus: in the inflamed hernia, without strangulation, the local signs precede, and greatly predominate over, the remoter and general signs; while, in a hernia which is inflamed after becoming strangulated, the remoter and general signs will still predominate over the local, and the history will tell that they preceded.

These means of discrimination, however, will not always suffice. You will meet with cases in which you will be uncertain whether the hernia be only inflamed and irreducible, or strangulated and inflamed; but in these cases you must not be uncertain of your practice. If you cannot very easily reduce the hernia, you must operate. The risk of operating on a hernia which is inflamed and not easily reducible is very small, in comparison with the risk of leaving one which is inflamed and strangulated; and even if you can find reasons for waiting, it must be with the most constant oversight, for an inflamed and irreducible hernia may at any time become strangulated, and will certainly do so if not relieved by rest and other appropriate treatment.

For a second rule: if the remoter signs of strangulation be present, the local signs are urgent for speedy operation in the same degree in which they are marked, or in even a greater degree; for severe strangulation is often associated with slight local symptoms.

But, to judge rightly from the local symptoms, each may need to be carefully weighed as evidence for the necessity of operating, or of adopting other methods of reduction.

In reference, then, to the chances of reducing a hernia without operation, it is a bad omen when one has quickly come down much larger than ever before. A great majority of patients give this as the beginning of their troubles. Sometimes they tell that, while making a great effort, they felt the descent come larger than ever; that they felt some pain or more than usual increase in the hernia, and could not reduce it in the customary way. More often the larger descent has happened without apparent cause. While the patient was sitting, or in bed, or quietly walking, the descent has occurred; but, perhaps, most frequently it has seemed connected with some diarrhœa, or colic, or spasmodic pain, or with some kind of turbulent movement of the intestines, for some hours, or a day or two, before the descent. In some cases, moreover, the unusual size of the hernia is attained at once; in others by gradual increase. In some it very quickly becomes painful; and these are rather less likely to be reduced than those in which pain follows more slowly.

I cannot give you any satisfactory explanation of these unusual descents of herniæ or of their becoming strangulated; but let them teach you not to be deceived by any notion that some unusual or startling event is necessary as a cause for the strangulation of an old hernia. And I believe it may be held as a safe rule in practice, that the more a recently descended hernia exceeds its usual size, the less is the probability of its being reduced without operation; and I think that the probability becomes the less, the more the size of the hernia continues slowly to increase; for not a few of those that have suddenly become very large, and then have not increased, may be reduced without operation, if the patient be put under chloroform soon after the descent.

Similarly, when general signs of strangulation exist, the harder and more tense a hernia is, the less is the chance of reduction without operation. The hardness may be due to any one of several conditions; but to whatever it may be due, it is an untoward sign. It is especially so, if the hernia be a small one. In large herniæ, the hardness may chiefly be felt at and near the neck and mouth of the sac, especially in inguinal herniæ; and you must take care not to be deceived by a sac which is soft and flaccid everywhere except at its mouth; for there may be strangulated intestine in the mouth of the sac, though the rest contain only soft omentum or fluid not sufficient to distend it. Nay, you must not let even a wholly soft condition of the hernia, or an open external ring, weigh down against the well-marked general signs of strangulation; for the piece of intestine at the mouth of the sac may be too small to give a sensation of hardness, or the whole hernia may be omental.

Again, if the general signs of strangulation exist, the more painful and tender a hernia is, the less, speaking generally, is the chance of reduction without operation. But here it is to be observed, that this rule holds less for recent than for old herniæ. A recent hernia may be horribly painful, apparently because of the tension of the stretched fibrous tissues about the sac's mouth. Yet such an one may commonly be reduced with the help of chloroform; but an equally painful old hernia, or one that has slowly become thus painful, may require speedy operation. And the operation must be all the more certainly done when, together with any of the remoter signs, there are other local signs, such as inflammation of the coverings of the sac, suppuration, emphysema, or the like. These are imperative for operation, without any previous attempt at reduction.

And for another rule: if the remote signs of strangulation be well marked, and the hernia cannot be otherwise reduced, you must operate, though there may be no marked local sign at all. Or, even beyond this, if the general signs of a strangulated hernia be present—the constipation, vomiting, and others—and there be anywhere a swelling which may be a hernia, though it seem not likely to be a strangulated hernia, the operation must be performed at the seat of that swelling.

Reasons enough for this rule may be found in the many cases in which the local signs of a strangulated hernia are so little marked that the patient, having his attention spent on the misery of his vomiting and epigastric pain, and other symptoms remote from the hernia, says nothing of the hernia itself. In not a few of my recorded cases, the hernia has been overlooked for a day or more; and the patient had been treated for spasms, colic, dyspepsia, or some other imitated disease, while the hernia was obscurely becoming hopelessly strangulated.

This last rule, of operating though there be no local signs of strangulation, may lead you into trouble; into the trouble and discredit of performing an useless operation, and seeming to do much more harm than good. But this you must face; it is just in instances such as this that surgery must incur the risk of seeming to do harm rather than miss the opportunity of doing good. I have operated thus uselessly in three cases. One was an irreducible umbilical hernia, in which there was no strangulation; but vomiting and other signs of strangulation, caused by (I believe) gall-stones. Another was a simple femoral hernia, with an internal strangulation of a piece of intestine far away from it. The third was an inguinal hernia with the same complication. All the patients died, and my operations seemed worse than useless failures. But you must face this risk of seeming wrong.

You may have to go further than in these cases; and if, for instance, a patient have two herniæ that are irreducible, and signs of strangulation, and you cannot tell which is strangulated, you must operate on both. I saw Mr. Stanley do this; and no one could blame him, though, when death followed, it was found due to an internal strangulation distinct from both the herniæ.

These are the chief rules, so far as I have been able to learn, according to which you may use the local symptoms of a supposed strangulated hernia as a part of the evidence for determining for or against an operation for reduction. And to these it may be briefly added that the local symptoms are generally less severe in the old than in the young; in old hernia than in new; in omental hernia than in intestinal.

[In his second lecture, Sir James Paget speaks of the trials at reduction that may be made, or may not be made, before operating.]

For a general rule, let me repeat, your first examination of a patient with a hernia supposed to be strangulated should not be with a design to reduce it at once, but rather with a design to make out what shall be done; what are the chances of reduction without operation; what helps shall be used to obtain it, if it be deemed desirable. Of course you may reduce the hernia, if reduction at once be easy; but do not go on trying if it be difficult. If the case be a bad one, you must first decide whether reduction without operation should be even attempted; and, if the attempt is to be made, what and how much it should be. For this decision, here are some general rules, which I find illustrated by my cases.

In very bad cases—as, for instance, when the patient vomits fæcal matter and has peritonitis, or is in collapse, with a small rapid pulse, hiccough, or other such extreme signs—there should be no attempt at reduction without operation. The risk of the operation is trivial in comparison with that of returning sloughing or ulcerating intestine into the abdominal cavity.

When the coverings of the hernia are so inflamed as to make it probable that sloughing or suppuration has taken place beneath them, reduction should not be attempted without operation; and, even when they are less inflamed, none but very brief and very gentle efforts should be made, for success is improbable, and failure may be mischievous.

The longer the signs of strangulation have existed, the shorter should be the efforts at reduction; and the more acute the signs are or have been, the more gentle should these efforts be. Only, here, do not reckon among the acute signs the intensity of pain in recent or greatly enlarged herniæ; for many of the most intensely painful herniæ are reducible with the help of chloroform, though they may need as much force as is in any case justifiable.

The longer and the more numerous and forcible the efforts at reduction made, in any case, before it comes under your care, the briefer and gentler should your own efforts be; if, indeed, you do not at once decide that enough has been done, and that there remains no fair chance of reduction without operation.

If you find that you have to do with a hernia which has been habitually irreducible, and in which you have reason to believe that, without any addition to them, the contents of the sac have become strangulated, you had better operate at once. You are not likely to reduce a protrusion which even before strangulation was irreducible.

Let me now suppose that, observing these rules, a first examination of a strangulated hernia leads to the decision that its reduction without operation is to be attempted: I cannot give a single rule of practice that shall always suffice for the next step after such a decision; but speaking generally, and of a great majority of cases which come under treatment, it is a safe rule of practice that, after a very warm bath and a few hours' rest in bed—say from three to twelve hours, according to the case—a single attempt at reduction, of reasonable force and length, should be made; that if this should fail, chloroform or ether should be given; that then, in some cases, but not in all a second attempt should be made; and that, if this should fail, or if it should not be made, the operation should be performed while the patient is still insensible.

The hot bath should be used in all cases that are not very bad, unless in old and feeble persons, whom it might depress too much. Among these, its place may be supplied by very hot fomentations, or by warm poultices over the hernia and the parts near it; and these must be used as the next best things when a hot bath cannot be had. Helped by rest, all these things are certainly very useful, whether by relieving the tendency to irritable muscular action, or by relieving congestion, or by whatever other means. Especially you may see their utility in hospital patients, who are commonly brought in wretched, chilled, and restless, with their herniæ tense and full and very painful, and their abdominal muscles starting into resistance at the least painful pressure. The heat of the bath, and bed, and recumbent rest, may remedy all this; and the hernia may become easily reducible, or may even reduce itself. It is commonly advised to have the bath so hot, and to keep the patient so long in it, that he may be very faint; and during this faintness to attempt the reduction while the patient is still in the bath. I more than doubt the prudence of this advice. It seems to me better to let the patient be simply soothed and relaxed in the bath, then to put him into bed wrapped in warm blankets, lying on his side, on his back with his knees drawn up, or with his pelvis a little raised, and then, after an hour or two of complete rest, to attempt the reduction. The advantage of this plan is shown in the many cases in which the surgeon gets the credit for reducing a hernia which the house-surgeon has failed to reduce. The house-surgeon tries in the bath, and fails; the surgeon, an hour or two later, succeeds, not, or at least not always, by greater skill, but by reason of the more favourable condition of the patient after a time of rest and warmth, and of his better position—lying flat instead of half sitting as in the bath. This employment of rest and the bath may be helped by opium whenever the hernia is very painful, and the patient too restless to have a chance of natural sleep. A grain of opium may procure the rest necessary for the quietude of the parts, but is less likely to be useful with femoral than with umbilical herniæ, and less likely with these than with inguinal.

In the old, and in others who may have had inactive bowels long before the strangulation, and in whom fæcal accumulations or abundant air may be in the large intestine, an enema even of a large quantity of liquid should be used; for the emptying of the large intestine may greatly facilitate the return of the hernia. Purgatives, I believe, had better not be thought of, if there be any marked signs of strangulation. There are no clear indications for determining the cases in which they might possibly be useful; and, if they do no good, they may do grievous harm. I do not doubt that some have gained advantage from purgatives; but in my notes and memory I rather find instances of mischief, and certainly no cases in which there seemed reason to think that the patients were the worse for not taking any sort of purgatives after evidence of strangulation.

After the warm bath and rest—and still speaking of only the majority of cases, for in some there is no time for these things—you may give chloroform or some other anæsthetic, and try to reduce the hernia. How you are to do this, I cannot tell you now; nor what time and force are reasonable to be used. You must imitate what you see done by men of repute, and use the best common sense you can. I can tell you some things that you must not do. You must not go to work as if you were resolved to reduce the hernia *per fas aut nefas;* you are not to spend an hour or even half an hour about it, or use all your force, or take off your coat and turn up your shirt-sleeves, or kneel on the bed, that you may press with the more weight; you are not to let half-a-dozen persons try their hands in turn. You are not to do these or the like things, all of which I have known as the sources of dire calamities. You are to be gentle and self-restraining, mindful of the delicacy of some of the structures you are handling, and that you may do them much more harm than would come of the operation which you are trying to avert. These cautions are the more necessary because, when the patient is under chloroform, you have nothing but your own sense and senses to tell you how far you may go without doing harm. The great value of chloroform and ether is that, by abolishing sensation, they put an end to the muscular resistance to reduction which whether he will or no, the patient makes when hurt by the pressure of his hernia. Hence they are most useful in the herniæ of which the difficulty of reduction is chiefly due to muscular resistance; in the recent, or in the recently much enlarged; in the inguinal more than in the femoral, and in these more than in the umbilical; in the painful more than in the painless. Chloroform and ether are by so much the most potent helps to the reduction of herniæ, that it may seem as if it would be right to use one of them without waiting for the influence of a warm bath, or recumbency, or any similar means. Sometimes it is right thus to do, especially in herniæ that have only very recently come down and are intensely painful. But more commonly, if there would be danger in waiting for three or four hours, it is because strangulation is so far advanced that the operation ought to be done at once, without any previous attempts at reduction. If there be no such extreme urgency for immediate reduction, there can be nothing but advantage in the use of the bath and the three or four hours' rest in bed; for they may make the hernia reducible, or, even if they fail of this, they may cause changes in it which are beneficial for both the performance of the operation and for the probabilities of recovery afterwards.

I have been speaking lately of the plans for average or medium cases; and before, of the cases in which no attempt at reduction without operation should be made. You may ask, Are there any cases in which it is justifiable to wait longer after the warm bath, and rest, and chloroform, and a fair attempt at reduction, have been tried and have failed? I will not venture to say that such a case for waiting cannot happen; but I am clear that your rule, with barely an exception, must be that, when you are satisfied that a hernia is strangulated, and you have failed to reduce it with such helps as I have indicated, you should operate. While the patient is still under chloroform, the operation should be done; and you should prepare for it before giving chloroform. Of course, if you are satisfied that the hernia, though irreducible, is not strangulated, you may wait; but in this case you must watch almost impatiently, for an intestine or omentum that cannot be reduced is very likely soon to become strangulated, and so is one that is inflamed or blocked up in a hernial sac. Still, if no signs of strangulation, especially if no vomiting, should supervene, you may wait from day to day; but if the signs do occur, especially if there arise vomiting, or increase of pain, or increasing rapidity of pulse and breathing, then you must operate at once, and you had better not try again at reduction. The trial is much more likely to do harm than to do good: you had better operate at once. Nothing does more harm to a strangulated or nearly strangulated hernia than the force of an unsuccessful attempt at reduction.

While you are waiting, you may use, in different cases, ice or warm dressings, enemata, aperients, or opiates. I cannot tell you the indications for each of them. I am glad to have had no sufficient experience of waiting to have weighed the several values of these things; glad, because I have no doubt that, for every case in which an operation has been avoided by waiting, there have been two cases in which lives have been lost by waiting too long. But there are at least one or two conditions favourable for all cases in which you desire to wait; namely, rest in bed and very sparing food. Nothing should be allowed to disturb the patient's rest, and no handling of the hernia should be permitted. Part of the value of ice and poultices and other like applications is this, that they all keep hands off.

Of other supposed helps I will not speak—of tobacco, and curious postures, and shakings with the legs up and the head down, and cupping-glasses, and other like and unlike things. They are ingenious wrong-doings, more dangerous than the operation which they are intended to avert.

In speaking of herniæ as being reducible, I have had in mind only such as can be completely and certainly reduced. But it is not uncommon to meet with cases of strangulated hernia, in which the reduction is doubtful or partial. As I look through my cases, I find many of these recorded, in which there was delay in sending patients to the hospital, because surgeons believed that part of the hernia was put back, and hoped that the rest would soon go; and some in which, even in the hospital, there was mischievous delay through the same fallacious hope. It is not easy to say what takes place in these partial or doubtful reductions. Some patients will tell you that the whole never did go back, and that what now seemed to be reduced might only be an additional protrusion. Sometimes, I think, air is pushed back from the intestine, or fluid from the sac; sometimes omentum is put back; sometimes, perhaps, part of the intestine; sometimes nothing—the whole notion of reduction being fallacious. The liability to deception is greater than you would imagine. You may feel a thrill of receding fluid, or a gurgling of air, which you may suppose to be what some describe as the characteristic gurgling (as if anything of the kind were infallibly characteristic), or something slipping back; but all may be fallacious. There is one practical rule for all these cases. If the symptoms of strangulation be not relieved by the supposed reduction; if the vomiting continue, or the pain, or the patient's sense of distress, or any other of the distinctive symptoms—then, without delay, you must operate. A partial reduction of a strangulated hernia, if it be not followed by a complete relief of symptoms, is in nothing better than no reduction.

I may add, that most doubtful reductions are not reductions; and of the partial reductions, none are safe except some of those in which intestine is put back and only omentum remains in the sac.

Be prepared also for cases in which reduction is, or seems, complete, and yet the signs of strangulation are not relieved. In these, a hernia may be returned *en masse*, or pushed into another sac, or between the peritoneum and fascia; or the case may be one of hernia complicated with an internal strangulation, or one of many other conditions so hard to discriminate and deal with, that I can give only one general rule for their management—viz., that if you can feel a lump at or near the hernial ring, as if there were something which may be a strangulated hernia, then you must operate.

To end what I should say respecting the propriety of operating, I ought perhaps to speak of the condition of the patient as affecting the risk of the operation by reason of age and general health and various complications. Among my cases, I find not only many of the fattest and feeblest, but examples of complication with phthisis, acute and chronic bronchitis, aortic constriction, phlebitis, gastric ulcer, diseased bladder, intestinal disorders of various kinds, and internal strangulation.

Patients such as these were one would not wound for any trivial good; but, with a strangulated hernia, the peril of doing the operation can hardly ever be so great as the peril of leaving it undone. Old age and feebleness, fatness, intemperance, or unsoundness of whatever kind, may add to the risks of this, as of any other operation; but all these risks must be accepted. A patient must not be allowed to die with a strangulated hernia, if by any means whatever the strangulation can be relieved; and you must not be averted from the operation by any consideration of the number of deaths that follow it. The deaths after the operation may be 50 per cent.; but the deaths due to the operation are not more than 2 or 3 per cent., and even these would probably have been deaths from the hernia had not the operation been performed. The great proportion of deaths is made up of those in whom the strangulation has done mischief which the operation cannot remedy. It is not unfair to maintain that, speaking generally, the deaths after operations for hernia are only to be counted as failures to save life, while the recoveries are to be counted as lives saved from certainly impending death.

The design of the operation for hernia is to divide the structures which tightly gird the protruded parts, so that these may be returned. These structures, forming what is called the stricture, are in some cases outside the hernial sac; in some, in its very substance; and, according to these and other differences, the operation may in some cases be completed without opening the sac, and in other cases must include this opening. The advantages of the two methods have been often discussed, and I may begin by speaking of them.

There can be no doubt, I think, that if all the rest of the operation were always the same, the advantage of reducing the hernia without opening the sac should always be sought. Thus to reduce a hernia is the next best thing to reducing one without any operation at all. The structures divided externally to the sac are insignificant, and it might be difficult to name an operation less endangering either life or health than this would be. The peritoneum is not wounded; the intestine and omentum are not touched or exposed to air; the wound may be small; any hemorrhage may be easily stayed, and must be all external. Thus the wound is favourable for speedy healing, and erysipelas or any other mischief is not likely to extend to the peritoneum.

These are sufficient reasons for always wishing and generally intending to operate without opening the sac, especially in old and feeble people and in cases of large herniæ. But you must not let your wishes carry you too far. They may lead you into great mischief. For, first, there are many cases in which the contents of the sac are not fit to be returned into the abdomen—for instance, when they are sloughing, or deeply ulcerated, or strangulated within the sac. The risk of returning these is so much greater than that of opening the sac, that you should not hesitate to open it whenever you have any, even slight, reason to suspect any of these conditions of the sac's contents. And such suspicion there must always be in these sets of cases—1, in those in which the strangulation has existed long, say four or more days, whether with slight or with severe symptoms; 2, those, of whatever date, in which the signs of strangulation are very acute; 3, those in which there are very marked signs of advanced or low inflammation in and about the sac; 4, those in which the contents do not go back easily and within two or three minutes after all stricture is fairly relieved. And, in measuring this case of going back, you must be scrupulous; for I have certainly done harm, and seen more done, by trying too long to reduce herniæ without opening the sac—fingering and clearing the parts, and pressing them many times; damaging intestine, and exciting suppurative inflammation all about the sac; so that when, at last, the operation was completed, much more mischief had been done than if the sac had been at first straightforwardly opened.

I think, then, you may take this as a safe rule in all ordinary cases; intend to complete the operation without opening the sac, but give up your intention if you find any reason to suspect complications, or very morbid states of the parts within the sac, or any such difficulties as would lead to the use of forcible or long continued efforts at reduction. Of course, the more you practise the operation, the less frequently will these difficulties hinder you; but you may keep to the same rule, and think it wiser to avoid difficulties than at all cost to overcome them. And, finally, when you are in doubt, open the sac; for, though the advantages are, on the whole, clearly in favour of not opening the sac, yet the amount of advantage is not so great as to justify any considerable risk for it. Rough statistics of operations are not to be taken as measures of this advantage. In the worst cases, the sac must be opened; and, of these, a large portion die without any regard to the manner of the operation.

As to the method of operating, there are many, and some good, anatomical rules, on which I shall not touch. They are admirably laid down in Lawrence on *Hernia*. I will only give some general rules, such as may be useful in nearly all cases.

In all, you should decide at first, if possible, whereabouts the stricture is, so that your first incision may be fairly over it, and give you room to act on it without needless length of cutting. In femoral hernia, you may be sure that the stricture is at, or within half an inch of, the femoral ring; and this is near enough for guidance for the first incision. So, in umbilical hernia, the mouth of the sac is always the seat of the stricture; and the middle of your first incision may be right over it. In inguinal hernia, the stricture is, in the large majority of cases, at or within the internal inguinal ring; and the incision should extend from the internal ring to beyond the external ring, and (according to the characters of the hernia) to a greater or less distance towards or along the scrotum. But, in inguinal hernia, the stricture may be at the external ring, or, being formed by the thickened mouth of the sac, may be pushed up towards the abdominal cavity, or down along the canal, or beyond the external ring to some distance in the scrotum. Moreover, in some rare cases of congenital hernia, there may be two strictures—one at each end of the open canalis vaginalis. For these cases, it is useful to apply a rule devised, I think, by Mr. Luke, for ascertaining the seat of stricture; namely, to observe at what point along the course of the hernia the impulse on coughing ceases. For, when a hernia is strangulated, the impulse can be felt as far as the stricture; beyond that, it cannot be felt: therefore, where the impulse ceases, there probably is the stricture; and this part must be fairly included within the length of your incision.

In femoral hernia, your first incision may be vertical, in a line drawn straight down from the spine of the pubis—a projection which you can always easily feel. This incision seldom needs to be more than an inch and a half long, and may sometimes be less. In umbilical hernia, a vertical incision of an inch and a half or two inches will suffice, in the middle line, so as to reach either the upper or the lower border of the mouth of the sac. But I am disposed to believe, though I have not tried it, that in large umbilical herniæ, two incisions, going to opposite borders of the ring, would be better than any one. In inguinal hernia, the incision should take the direction of the neck and upper part of the hernia, and its length must vary according to the size of the parts to be returned.

Through these incisions you must go on and on, through the several layers which your anatomical dissections of healthy parts will sometimes enable you to recognise, till you come to the sac. The thickness of these layers is more various than you may suppose. Especially in small femoral herniæ, you will often find an unexpected quantity of fat about the sac; and in umbilical herniæ, very much more fat about the mouth of the sac than the thinness of the integument over it would at first suggest.

Through whatever thickness, you must continue cutting in the same direction; and when you are fairly on the surface of the sac, keep to the same line. Do not clean the whole front of the surface of the sac; do not separate it from the surrounding textures. No good can come of this, but much harm may. You want nothing more than a linear division of the stricture, whether with or without a linear opening of the sac. All that is done on either side of this line is useless or mischievous.

When you have thus fairly reached the sac, and have exposed its neck and mouth or narrowest part, you must proceed differently, accordingly as you propose to complete the operation without or with an opening of the sac. In the latter case, you open the sac first near its mouth, and then along the length and full extent of your external incision; and then divide the stricture from within. You may do this on your finger-nail or a director, and with cares about the intestine and other structures, which are insisted on in all handbooks. In the former case, when you intend not to open the sac, you must find where the stricture is, and divide it outside the sac.

Among femoral herniæ, there are differences as to the seat of stricture which I cannot explain to you, but which my cases made very clear to me. In some instances, as you trace up the neck of the sac, you find it tightly banded across by the layer of fibrous tissue called Hey's ligament—a layer traceable as a falciform edge of the fascia lata, where that fascia is connected with the crural arch, and is thence continued to Gimbernat's ligament, bounding the upper part of the saphenous opening.

Sometimes a fair division of this layer of fibres up to the edge of the crural arch is sufficient to render the hernia reducible; and here, with the reduction, should end the operation. But, with more cases, this is not sufficient; and you may feel the stricture formed by bands of fibres which encircle the neck of the sac, and which must be divided, band by band and layer by layer, till none can be felt. These fibres are, I believe, bands of tough connective tissue, belonging to the cribriform fascia, through which the hernia has protruded. Very rarely, however, even the division of these, and of Hey's ligament too, is not sufficient; for the stricture is formed by thickening of the mouth of the sac itself. This condition, which is the common cause of stricture in inguinal hernia, is very rare in femoral; but it certainly does occur; and, in any case well suited for the operation without opening the sac, you may try to thin the mouth of the sac without opening it, and thus to make it extensible enough for the return of its contents. You may try this; but let me add, the chances of success are small. You are much more likely to cut into the sac at some thin place; and, when you have done this, you may as well enlarge the opening and divide the stricture from within.

It is this uncertainty as to the exact cause of stricture in strangulated femoral hernia, which makes it advisable to put on a strong resolve not to use too much time or force in endeavouring to operate without opening the sac. You will be apt to think, when you have divided one thing, that now you will be successful; and you try to press back the bowel. But you fail; and then you divide something else, and try again; and now again you fail. And thus you may go on, till you have done more harm than you would have done by a straightforward opening of the sac and immediate easy division of its stricture and return of its contents. Keep this in mind, that an easy reduction from an open sac is better than a difficult reduction from a closed one.

In umbilical hernia, the case is simpler. The stricture is always in the tough fibrous tissue of the sheath of the rectus. When you have reached this, commonly going much deeper through fat than you would expect, and not only deeper, but further under the sac, you may be able to divide the stricture without opening the sac; but this is difficult, for the sac is always very thin, and there may be little tissue between it and the fibrous ring. Still it is well to try, but not too long. You are more likely to open the sac at or close by the stricture; and, if you do this at all, you may as well save time and force by opening it more widely.

In inguinal hernia, the stricture is in many cases, and was in the majority of those on which I operated, formed by the mouth of the sac, thickened and hardened by what appears to have been an inflammatory process, producing a scar-like and contracting tissue. This tissue forms a band about a fourth or a third of an inch in width, and about a line in thickness, and sometimes has a thin sharp inner edge. By the way, let me say that the formation of this band is not the result of wearing trusses. I have seen it very marked in patients who never wore a truss; and I have seen the sac thin and soft in every part in those by whom trusses have been long worn. But, however it may be formed, this annular thickening and contraction of the mouth of an inguinal hernial sac is a common cause of stricture. On account of it, you should proceed at once to expose the mouth of the sac; unless, indeed, you should have found the tissues outside it so tight that you may fairly believe the division of them will be sufficient for permitting the reduction of the hernia. When you have exposed the outside of the thickened mouth of the sac, you may still achieve the reduction without opening, by gradually thinning the mouth—dissecting off band after band from any portion of it. Sometimes the mouth will yield sufficiently at a part thus thinned to stretch and allow the reduction; but more often, I think, you will fail, and will have to open the sac and divide the stricture from within.

Here, as with femoral hernia, be scrupulous not to spend more than fair force and time for the sake of the reduction without opening the sac. It is a good thing to succeed; a bad thing to fail. You must measure how much risk of harm it is right to incur for the hope of doing good.

If the reduction of hernia be accomplished without opening the sac, you will have attained the best immediate object of the operation; but remember that fallacies of reduction are possible here as well as in the cases in which no operation has been done; they are, however, less mischievous, for, if the stricture be completely divided, there will be no strangulation of whatever remains in the sac. Especially you must have no fear if, as commonly happens, after returning intestine, some omentum remain in the sac. This will do no harm; but if more than omentum have remained in the sac, and the signs of strangulation be not relieved or lessened, you must operate again and open the sac, regarding these cases in the same light as those of partial or doubtful reduction, of which I spoke in the last lecture. But suppose the sac opened, as it should be in nearly all bad cases, and in many which, though they are not bad, yet may be called difficult, here may occur the most difficult question of all, What is to be done with the contents of the sac? Of course, in most cases you are to return them; but in many you are not, and which are which?

Look first to the character of the fluid which, in most cases, you will let out of the sac. In most cases, not in all; for, in some small femoral herniæ, especially in very thin dry people, and in many umbilical herniæ, and in any that contain a large quantity of omentum, there may be no fluid, or too little to be distinctly seen; but if there be enough to judge from, you may deem it a good sign if the fluid is clear, and yellowish like serum, or, rather, like liquor sanguinis—for it will coagulate spontaneously. This indicates only such an exudation of fluid as may come from a simply congested piece of intestine, or from a piece not badly inflamed; and the cases would be very rare, if there can be any, in which intestine found behind fluid such as this might not be returned. The same may be said when with fluid such as this there are flakes or bands of lymph or fibrinous exudation; for these tell of only such inflammation as may safely be recovered from when the intestine is returned. I am disposed to say the same of the cases in which the fluid is clear, but more or less deeply blood-stained; for this exudation of blood-cells or blood-colour is not characteristic of any serious morbid change in either the sac or its contents. But when the fluid of the sac is turbid, brownish, muddy, it tells of more advanced changes in the intestine or in the omentum; and the further it goes in this direction the more carefully must you consider whether these are in a fit state to be returned. You will probably have to decide that they are not fit, when the fluid has a distinct fæcal or putrid odour; and of course they are not fit when the fluid has fæcal matter mixed with it.

I do not venture to say that the characters of the fluid contents of the sacs of strangulated herniæ are to be absolutely relied on as guides for practice; but they are good evidence to be taken into the general account, for they fairly represent the state of mere congestion or inflammation, or more or less advanced decay or decomposition, or giving way of the walls of the strangulated intestine and omentum.

Not rarely, when you have divided the stricture and returned the contents of the sac, fluid runs from the peritoneal cavity. I do not know any rule of practice but that you must let it run as long as it will, and, if it be of very unsound appearance, not close the wound till the fluid has ceased to flow, if even then.

As to the omentum which the sac may contain, and what to do with it; if there be a small quantity—say two or three square inches—and this be not adherent, and not more changed than by congestion or slight inflammation, there can be no question that you are to return it after the intestine; and if there be a piece of even very large size, and not more changed in texture, you had better return it if you can without much force or expense of time. But it sometimes happens when the abdomen is tense with over-filled intestine, that you cannot return a large piece of omentum without much difficulty. What then? shall you cut it off or leave it in the sac? I advise you to leave it. I believe that the cutting off, with the necessary ligatures or other fastenings of vessels, adds to the dangers to life; while the leaving of omentum is only sometimes followed by greater difficulty in the fitting of a truss—a difficulty which is not great enough to justify any risk of life.

Still more may this rule of leaving omentum in the sac be observed when a large piece of it is hardened and thickened as by old disease. When a small piece is thus changed you may, I believe, return it.

When omentum is adherent to the sac, but in other respects fit to be returned, you should break the adhesions and return it, after stopping all bleeding. If it be not fit to be returned, leave the adhesions; and in any case do not break adhesions so near the mouth of the sac that their vessels are likely to bleed into the abdominal cavity.

When omentum is sloughing, or nearly sloughing, leave it, that it may cast its sloughs outward.

But the chief questions in these operations are concerned with the state of the strangulated intestine and the manner of dealing with it. You are to judge chiefly from the colour and the tenacity. Use your eyes and your fingers; sometimes your nose; very seldom your ears, for what you may be told about time of strangulation, sensations, and the rest, is as likely to mislead you as to guide aright.

As to colour, any tint, from the natural gray, through various shades of rosy or ruddy pink, or redness, up to the deepest crimson, even verging to blackness, may be consistent with fitness for returning of the intestine, if the texture be good. All these tints may be due to congestion and stagnation of blood, or to extravasation of blood into the intestinal walls; and all these may have been without such inflammation as would spoil the texture of the intestine, and may not have endured long enough to kill it. I am disposed to say that you may return intestine of any colour short of black, if its texture be good; if it feel tense, elastic, well filled out, and resilient, and collapsed or sticky; and the more the surface of the intestine shines and glistens, the more sure you may be of this rule.

When a piece of intestine is thoroughly black, I believe you had better not return it, unless you can be sure that the blackness is wholly from extravasated blood. It may not yet be dead, but it is not likely to recover; and, even if it should not die after being returned, there will be the great risk of its remaining unfit to propel its contents, and helping to bring on death by what appears very frequent—distension and paralysis of the canal above it. But, indeed, after blackness of strangulated intestine commonly tells of gangrene already; and of this you may be sure if the black textures are lustreless, soft, flaccid, or viscid, sticking to the fingers or looking villous. Intestine in this state should never be returned.

Colours about which there can be as little doubt, for signs of gangrene, are white, gray, and green, all dull, lustreless, in blotches or complete over the whole protruded intestine. I cannot tell why there should be so many colours in different cases, or sometimes even in the same case; but all are alike certain signs of gangrene, and they are always combined with loss of due tone and texture of the intestinal wall. Intestine with these marks, even though they be small, must not be returned.

Then, as to the texture of the protruded intestine: it should be, for safety of return, thin-walled, firm, tense, and elastic, preserving its cylindrical form, smooth, slippery and glossy. The further the intestine deviates from these characters, the more it loses its gloss and looks villous, the more it feels sticky and is collapsed and out of the cylinder form, the softer and more yielding, the more pulpy, or like wet leather or soaked paper, the less it is fit for return. And when these characters are combined with so many colours as I have described, the intestine must be taken to have perished, and had better be laid open, that its contents may escape externally and do no harm.

But short of gangrene, there may be ulceration of the walls of the intestine. The usual place for this is where the intestine is girt by the mouth of the sac, and it is most frequent in femoral herniæ long strangulated. In these it is especially the sharp hard edge of Gimbernat's ligament, which seems to cut into the intestine, thinning its wall and at last piercing it; and the chance of this having happened is enough to justify the rule that, where the strangulation has been sharp and long, the intestine should be gently drawn down after the stricture is divided, in order to see that there is no great injury of its walls where the chief pressure of the stricture has fallen on them.

Here, too, because they are similarly dangerous to life, I might speak of laceration of the intestine in too violent attempts at reduction, or wound of it in operation; but I have no personal experience of such cases, and can add nothing to what you may read in the best treatises on hernia—such as that of Sir William Lawrence, or in the chapters devoted to hernia, by Mr. Erichsen, in his *Science and Art of Surgery*, or by Mr. Birkett in Holmes's *System of Surgery*. These will supply you not only with their authors' experience, but with what they have gathered and set in order from the writings of others. Limiting myself to what I have studied in my own cases, I must omit many things besides ruptured and wounded intestine; such as the various complications of strangulated hernia with hydrocele and misplaced testicle, with varicocele, and with accidents of the operation, such as hemorrhage from the epigastric or the obturator artery. Some of these things I have never seen; others I have seen only once or twice, and have learned concerning them nothing but what you may learn by reading the works which I have referred to.

But, as to the treatment of sloughing and ulcerated intestine of which I was just speaking, I will only say that it has always seemed to me more prudent to incur a great risk of having a permanent external fæcal discharge by leaving the intestine at the wound, than to add to the risk of life by returning anything which it may seem possible to repair by suture or any such means. Of course, these means are not to be thought of if the sloughing or ulceration be of more than very small extent; but even in the smallest, unless in some very rare cases, I would not add to the inevitable risks of life by returning the damaged intestine. In cases of hernia, the saving of life is so much more important than anything else, that we ought not to incur risk of life for anything less than the highest probability of saving a patient from some life-long distress.

After the action of the bowels, if all still go on well, there is no need of considering anything but the patient's comfort and the local treatment, and the diet may be of the plainest kind. Excess is more likely to be mischievous than spareness.

Among cases that do not go on well, there is a great variety; but I shall speak of those alone in which the wrong is in something peculiar to hernia. Of course the wound of the operation may lead to any of the evils that may follow other wounds, as erysipelas, pyæmia, and the rest; but these I shall almost pass by.

Among my cases, I find some in which ill-looking symptoms, such as diarrhœa or colic, followed the operation, but meant no serious mischief, being only the continuation of the intestinal disturbance which preceded the strangulation. I have already spoken of this matter, but it is worth repeating: that it is common for the descent and strangulation of a hernia to be preceded by some intestinal disturbance, the signs of which may be suspended during the strangulation, and renewed after the operation. Whatever the disturbance, it may be treated, or left alone, as if no operation had been done; but it must not be forgotten in estimating the meaning of any symptom of ill-doing.

Of these symptoms, one of the chief is vomiting. If a patient vomit once or twice soon after an operation for hernia, it may only be because the stomach was filled with secretions before the operation, and now finally empties itself. In this is no harm—perhaps some good. But, if the vomiting continue, it may be a sign of the gravest import. It may, indeed, be due to chloroform. I have seen several instances of this, and among them one in which chloroform-sickness continued for three days after the operation, endangering the patient's life. Generally you may distinguish the vomiting due to chloroform from that due to peritonitis or unrelieved strangulation, by its being attended with horible nausea, like sea-sickness; by its producing no fæcal fluid or abundant gastric secretion, there being more retching than vomiting; and by the patient's feeling relieved of his hernia, however wretched he may feel with his nausea. If the pain and distress of the hernia be relieved by the operation, and, except for vomiting, all seem well, you may be nearly sure that the vomiting is due to chloroform, and commonly you must wait till it spontaneously subsides. I believe you cannot cure it, and food put into the stomach only aggravates it. The patient had better be without food, if in fair strength; but, if very feeble, he had better be maintained with enemata of milk, eggs, beef-tea, and wine.

If vomiting go on for six or more hours, or for days, after the operation, and be not due to chloroform, it is a very bad sign—I had nearly said a mortal one; for generally it tells that the operation has failed in its design. Either the strangulation is not reduced, or the intestine is paralysed above the strangulation, or there is peritonitis or sloughing or perforation of the intestine, or some some such trouble. Very rarely the untoward conditions indicated by continuous vomiting are relieved spontaneously or with repeated doses of opium.

The persistence of abdominal distress, with tension and pain and colic, after the operation, is not so serious. If other symptoms be relieved, these probably will be; and they may generally be treated with large enemata or aperients, such as the sulphate and carbonate of magnesia. But there is no need of haste to give these things. The abdominal troubles which they are to relieve are not due to serious disease, but probably to intestinal accumulation, which began before the strangulation, which would be very slow to destroy life, and may be allowed to remain till it can be treated without risk. In such a case as this—

a not very rare case—when all seems well except the abdominal pain and tension, be on the watch. If there be no change, do nothing. With time, the intestines will empty themselves. If there be increase of pain, without increase of pulse or breathing, or other evidences of fever or inflammation, give enemata or aperients. I am sure you may manage cases of this kind better and more deliberately than I did some of those which I have recorded. I see now that I was over-busy with them, and was only very fortunate in that I did no harm.

A large group of cases, much worse than these, may be made of those in which the operation gives little or no relief: all goes on after it as all did before, or everything becomes worse. Few cases can be more grave than these. You may think yourselves happy if, from twenty such cases, you can save one.

The failure of relief from the operation may be due to the utter exhaustion of the patient. I have had to operate on patients already dying. I could not refuse to operate, for I could not be certain that it would be useless; but it proved useless, and seemed mischievous. The intestine was returned, and all put right; but the patient was too exhausted, as one may say, to be conscious of relief, and went on dying, although carefully fed and nursed.

Or the failure of relief may be because the strangulation remains—a constricting band or misplacement of the intestine, or some such thing, having been overlooked. In such a case, especially if you have not opened the sac, you you must open the wound and the sac; enlarge the opening through the stricture; find, if you can, the strangulated intestine or whatever may be wrong, and, if possible, set it right. You may be so fortunate as to succeed—more fortunate than I have been. But then, in two of my cases, an internal and distant strangulation coincided with that of the hernia. This was irremediable —could not be reached; and the second operation was as useless as the first.

But by far the most frequent cases in which the operation gives no relief, or only some slight and very brief relief, from the signs of strangulation, are those in which the intestine does not recover itself. It remains nipped, powerless, congested or inflamed, spoiled, and incapable of contraction; while the part of the canal above it becomes distended, and after a time powerless, the abdomen becoming constantly more tense, though it may be with less turbulence of the intestines. This condition is most frequent in the old, and after long strangulation; it is commonly attended with peritonitis; and no doubt the inflamed state of the muscular tissue of the intestine, both in and above the strangulated part, is often the cause of the loss of muscular power, or a serious hindrance to its recovery. But peritonitis is not a necessary part of the calamity. I believe I have had cases in which no peritonitis existed beyond the strangulated part. In such cases as these, you may find the best hope, though the best is seldom good, in opium, food, and wine, all of which you must give by the rectum, if the stomach will not retain them. Your object must be simply to keep the patient alive while, in time, the intestinal canal, being at rest, may regain power. Very small quantities of food may suffice for this—a few spoonfuls by the mouth every hour or two; and, twice or three times a day, injections into the rectum of milk, beef-tea, egg, wine, and laudanum, mixed all together.

Very similar to these cases are those in which peritonitis, having begun before the operation, is not relieved by it. There is, plainly, no reason why the relief of strangulation should at once remedy the peritonitis which the strangulation produced; and it sometimes seems to continue quite unaffected. Indeed, you had better expect that this will be so, and follow what is a very good general rule—that, namely, of giving opium directly after the operation in all bad cases of strangulated hernia, unless there be some clear reason for not giving it. I have seen no harm come from this plan, and I think it has sometimes done real good. What are the bad cases I have already told you. In any or all of them, you may give a grain of opium, or an equivalent subcutaneous injection of morphia, directly after the operation; and then watch and determine whether to give more, or what else to do. Especially, you may expect to have to give wine very soon after the operation, for the patients are generally feeble.

Thus, then, you may have in mind four sets of cases in which the operation for strangulated hernia, though, to all appearance, well done, does no good at all, or too little to be counted. It may be so in patients utterly exhausted;

in cases of persistent strangulation at the hernia or elsewhere; of intestine rendered powerless; of continuous peritonitis. Of all these I have seen examples. There may be others which I have not seen or have overlooked. From all of these you may distinguish in thought, and generally in fact and practice, those sets of cases in which untoward events arise after a clear interval of relief from the operation. All may go on well, or at least not badly, for a time; the patient may have a clear sense of relief; and the sickness and other bad symptoms may cease for hours or some few days; and then come trouble and disappointment.

The cases that may be thus grouped are many and various. I find among my notes instances of acute inflammation of the hernial sac and its coverings; simple acute peritonitis, such as might be called traumatic; asthenic peritonitis, probably of erysipelatous nature; acute peritonitis, with rapid collapse, from intestinal perforation or rupture; simple inaction or paralysis of intestine. And to those which were peculiar to operations for hernia may be added other calamities, such as might occur after any operation, as diffuse cellulitis, erysipelas, phlebitis, and others.

It is not possible to speak of all these things now—hardly even appropriate; for, though those in the first list are associated with hernia, they are not peculiar to it, and their pathology and treatment must be studied on a broader field. The peritonitis must be dealt with according to the same rules as that which has nothing to do with hernia, using great care to determine which of the forms I have enumerated is in each case present. The strangulation may itself cause peritonitis; and this, as I have said, beginning before the operation, may continue after it. The wounding and exposure of the peritoneum may excite its inflammation, or greatly aggravate that which existed before the operation. In both these sets of cases, the signs of peritonitis will be observable directly after the operation, or, at the furthest, within twelve hours after it; and these will generally be cases of acute, or, so far as the constitution of the patient will allow, of asthenic inflammation. But you may generally distinguish from these the cases in which peritonitis sets in after a longer interval, and in which it is rather of an asthenic type, whether it come from giving way of the intestine, or from such conditions as would produce erysipelas after external injuries.

Do not suppose me to pretend that, in every case of peritonitis after hernia, you can easily determine to which of these different types of inflammation it belongs. You can determine often; you should try to do so always; for according to the type of inflammation must be your treatment. In the sthenic inflammations, you may give great comfort and help to recovery by free local bleeding with leeches, by large poultices over the abdomen, by weak saline and alkaline drinks, by the plainest and least stimulating diet. In the asthenic, opium is the only remedy that is generally useful. It used to be calomel and opium; but I believe the calomel did harm oftener than good. And with the opium must be rest and warmth, and liquid nutriment and diluted wine. And I can state no more general rules than these; for the rest of the treatment must be determined separately for each case.

Now, besides these very serious evils that may follow operations for hernia, some local troubles may ensue, of which a few are worth telling you of.

Perhaps the most common is acute inflammation of the hernial sac, alone or with the immediately adjacent part of the peritoneum. It is, I think, most likely to happen after operations for large herniæ in old people, when considerable force or time has been used in the reduction. You may know it best by the localised pain and tenderness with acute fever, without the signs of unrelief or of general peritonitis of which I lately spoke. There is no severe illness, but the general condition appropriate to a sharp local traumatic inflammation; and you may treat it in this view, with complete rest and warm moist coverings of the part, and very little food; and in the acute cases in robust people, with copious leeching. In the acutest case which I have seen, I applied ninety-eight leeches in three days after the operation, with great comfort, and I think great advantage, to the patient. That was twenty years ago; but it would still be right to do the same.

Another local trouble is acute inflammation of the cellular tissue outside the sac. It is chiefly seen after operations for scrotal hernia and for deep-seated femoral herniæ. Commonly, the case appears going on well for a few days; and then comes a blaze of inflammation in and beneath the skin, leading sometimes to abscess, sometimes to diffuse suppuration. There is in these cases nothing peculiar to hernia. The same troubles may, as you know, follow any other operation; and they always need the same general means of treatment. I have never seen serious evil ensue in any case of the kind.

I might tell of other hindrances to recovery from the operation for hernia; but I limit myself to those of inflammation of the testicle, of sloughing of the scrotum, and others which I have been able to study practically, and I pass the others by, as I have done many other things, especially the complications of herniæ with various local diseases, such as hydrocele, varicocele, undescended testicle, and others. I have seen only one or two cases of each, and can tell nothing which is not already well told about them. Indeed, for a conclusion, I must say that, though to some of you it may have seemed excessive to give four lectures on strangulated hernia, I have treated the subject very superficially, very incompletely. One lifetime is not nearly enough for its complete personal study, in even so large a field as this hospital supplies.—*British Medical Journal, April* 6 *and* 27, *May* 18, *June* 1, *and July* 6, 1872, *pp.* 359, 437, 515, 573, 6.

46.—THE TREATMENT OF STRANGULATED HERNIABY PUNCTURE OF THE INTESTINE.

By the Editor of the Medical Times and Gazette.

The very great importance to surgical practice which the introduction of any plan for the treatment of strangulated hernia implies, induces us to refer to a method suggested by Mr. Bryant, in a clinical lecture delivered at Guy's Hospital, in the month of February of this year.

It will be in the recollection of some of our readers that, in the third lecture of his series (which appeared in our columns on April 20), Mr. Bryant gave the details of a case which occurred to him in 1871. It was that of an old man, aged 71, the subject of strangulated scrotal hernia, upon whom he had performed herniotomy, it being necessary to expose the bowel in order to return it. Owing to the restlessness of the patient, however, the gut again descended in a few hours, and all attempts to reduce it failed, until the large intestine was punctured in four or five places with a grooved needle, and a quantity of flatus (but no fæcal matter) let out. The patient recovered without a single bad symptom. In his subsequent remarks upon this case, Mr. Bryant observed that it proves clearly that puncturing the intestine freely may be resorted to with every prospect of success in some cases of hernia. He raised the question whether it is not possible to reduce some herniæ without any operation at all, and he stated that he had made up his mind to try the practice in large scrotal and umbilical herniæ, and thought favourably of its employment in all cases of acute internal strangulation due possibly to bands or twists.

Since the publication of this lecture the treatment of puncturing the bowel to remove strangulation has been followed in three cases (which are now well known), two of which have been published. The third occurred in the practice of Mr. Hulke, in the Middlesex Hospital, in the early part of May. The case was one of internal strangulation from a band, in which abdominal section was performed, and the distended small intestine punctured (ultimately laid open) before reduction of the bulging portions could be effected and the wound closed. This case, with Mr. Hulke's remarks, will shortly appear in our pages.

Of the two published cases, one was reported by Dr. Léon Labbé, of the Hôpital La Pitié. It was a strangulated inguinal hernia, of about eighteen hours' duration, in an old man, aged 70. Here, as the taxis failed, puncture with the aspirator was proposed, and a No. 2 needle introduced. In eight days the patient was well. The other case was one brought before the Académie de Médecine, on May 21, by M. Demarquay, a brief notice of which was given in the *Medical Times and Gazette* of June 1. In this instance, after taxis had failed, a fine trocar was passed into the centre of the tumour, which was a strangulated congenital inguinal hernia, and by means of Potain's aspirator about 120 grammes of intestinal liquid was drawn off into the recipient. No ill-consequence followed, and the patient rapidly got well.

Thus, then, this new mode of treating certain kinds of hernia, which has been tried and suggested by Mr. Bryant, has since found favour in English and foreign practice; and we hope, as time goes by, to be able to report favourably of it as a means of relief in those cases in which hitherto little or no success has crowned surgical efforts.—*Medical Times and Gazette, Aug.* 3, 1872, *p.* 120.

47.—STRANGULATED INGUINAL HERNIA OF THE RIGHT SIDE.

ASPIRATING PUNCTURE; ISSUE OF FLUID AND GAS; IMMEDIATE REDUCTION; CURE.

By Dr. Leon Labbe, Surgeon to the Hôpital La Pitié, Vice-Professor at the Paris School of Medicine.

The extreme importance which the process of reducing hernia after an aspirating puncture must rapidly assume in surgical practice, the limited number of facts which have been known until now, and the interest there is in encouraging medical men to follow this direction, induce me to communicate the following case which I have just had an opportunity of observing.

In the night of June 20th Mr. D., aged seventy, an exceptionally strong and robust individual, after a violent fit of coughing felt an intense pain in the right inguinal region. This was followed in a few minutes by nausea and vomiting; whilst a somewhat large tumour showed itself in the right inguinal region.

On the 21st, at 6 p.m., I first saw the patient, together with his ordinary medical attendant, who had employed taxis with great care, but to no effect. I then tried taxis myself, but was equally unsuccessful. The nausea and vomiting still continued; pulse 75. Taking into account the circumstance that strangulation dated only about eighteen hours, and that probably the anatomical lesions would be very slightly advanced, I without hesitation proposed puncture with the aspirator, and without further delay I introduced the No. 2 needle. About ten grammes (two drachms and a half) of a yellowish liquid immediately escaped, together with a quantity of gas which I cannot exactly estimate. The tumour, which was as large as the fist, flattened immediately; and a very gentle pressure exerted for one minute near the neck of the sac caused complete reduction of the hernia. The patient felt immediate relief, and expressed his satisfaction.

During the few hours which followed—from 6 to 11, and more especially between 8 and 11 p.m.—there was a little vomiting, and more particularly nausea. The patient was somewhat feverish, and had slight rigor. I had administered, as I always do after reduction of hernia, whether by taxis or operation, pills of the gummy extract of opium (each containing one centigramme—one-sixth of a grain,—to be taken one every two hours, so that ten or twelve centigrammes may be absorbed in twenty-four hours), with the object of bringing on paralysis of the intestines. At 11 p.m. the symptoms above alluded to all disappeared, and from that time the patient enjoyed the most complete comfort.

June 22nd. Pulse 60; countenance normal; scarcely any tenderness in the abdomen over the inguinal region.

23rd. Three natural stools; no pain or fever; appetite excellent.

Eight days afterwards the cure, which had been evident even on the third day, had become quite permanent. The patient's health is now excellent.—*Lancet, July* 20, 1872, *p.* 78.

48.—ON THE TREATMENT OF HEMORRHOIDS.

By the **Editor of the British and Foreign Medico-Chirurgical Review.**

[The following is from a review of works on the Surgery of the Rectum recently published by the following authors, viz.: Dr. Wm. Bodenhamer, Dr. W. H. Van Buren, of New York; and Mr. T. J. Ashton, Mr. H. Smith, and Mr. Wm. Allingham, London.]

In the treatment of hemorrhoids we have to deal, firstly, with the thickened and inflamed portion of the mucous membrane of the rectum and with the enclosed venous plexus; secondly, with the large arterial supply from Quain's parallel arteries from above; thirdly, with the muco-cutaneous membrane of the anus liberally endowed by branches of the pudic nerve, continuous below with the skin of the perineum. What line of action can be clearer; we must remove the excrescence, prevent hemorrhage, and obviate nervous irritation and preventible pain; and avoid risk of phlebitis and of pyæmia.

Dr. **Van Buren** says: "The means which have been employed to destroy the tumours are various; I have tried them all except excision, and can confidently recommend to you *strangulation by the ligature* as the safest, surest, and most manageable procedure.

"The use of the knife or scissors was fully demonstrated by Dupuytren's experience to be dangerous; he lost several cases from hemorrhage, which comes on insidiously after the operation—the blood not escaping externally, but accumulating gradually in the cavity of the bowel. The actual cautery is a repulsive procedure, and not easily applicable under all circumstances. Galvano-cautery promises well, when proper apparatus is at hand. Of the potential caustics, nitric acid acts too slowly; and the others, in addition to this objection, are unmanageable. Chassaignac's *écraseur*, and its modifications, in which iron or copper-wire is substituted for the chain, require more time in their application, and bleeding *does* sometimes follow their use in this operation. The various clamps recommended by the instrument makers are, to say the least of them, unnecessary; and injection of the tumours with solution of persulphate of iron is painful and inefficient. On the other hand, a stout ligature of silk, or gut, or hempen thread, is always readily obtained; its application requires no great amount of anatomical or surgical skill; and the result you will find certain and satisfactory—if you follow the rules I am about to give you.

"The patient being in good condition for the operation, with bowels acting regularly and well, let him delay his daily stool until your visit, and present himself to you immediately afterward, with his piles thoroughly protruded; let him stand, bending forward over a bed or chair, with the parts exposed to a good light. Having provided yourself with a tenaculum, a double hook—such as is found in every operating-case, forceps, scissors, and several stout needles armed with long double ligatures, seize the largest of the tumours with your hook—which you transfer to an assistant, telling him to draw gently upon it; then pass a curved needle pretty deeply through the base of the tumour, draw it through to the middle of the double ligature, cut the needle free, and proceed to tie one of the ligatures as deeply as possible, at either side of the base of the tumour, drawing your first knot tightly, so as to strangulate the included tissues thoroughly. Repeat this procedure upon each of the remaining tumours—there are rarely more than three or four at the most, sometimes only one or two—cut off your ligatures short, and then carefully replace the strangulated tumours within the cavity of the bowel. This is the outline of the operation; now for the details. If your patient cannot get his bowels to act at the time of your visit, or if the tumours do not come down satisfactorily, let him have an enema of tepid water, and try again. If they tend to retract during the operation, let him sit over warm water and strain; and it is well to have a curved spatula, or Sims's speculum at hand; also, to transfix and thus secure all the tumours you propose to ligate, before you begin to tie. Introduce your curved needle from without inward, protecting the gut from its point by your finger; strive to get well up into the bowel, and if possible, avoid including any of the delicate semi-mucous integument of the anus in your ligatures, as this increases greatly the pain of the operation at the moment, and afterwards. If you are successful in this, the pain of the operation is really trifling. If you cannot succeed to your satisfaction, it is better to divide the integument on the anal side of the tumours' base by the knife or scissors, and, in tying, lodge your ligature in the groove thus made. This is a practical point of importance, for the delicate semi-mucous membrane of that portion of the rectum habitually grasped by the sphincter is far more sensitive to violence than the gut within; and, when included in a ligature, it is painfully pinched by the irritated muscle, becomes œdematous and rolls out at the anus, giving the patient the unpleasant idea that his piles have come down again. Moreover, like one of the varieties of external hemorrhoid, this sort of swelling is very slow to disappear, and then leaves behind it a tab of loose skin.

"In the majority of cases requiring this operation your patient will claim the benefit of anæsthesia, or, if of the other sex, it will become you to recommend it, so as to spare her modesty, as well as to prevent possible pain. Here, not having the voluntary assistance of the patient in forcing down the hemorrhoids and presenting them for operation, you will be obliged to vary your mode of procedure very materially, or you will operate at a disadvantage.

"I have adopted, under these circumstances, the following mode of managing the patient, and it has succeeded so well in my experience—which covers now a large number of cases—that I can safely recommend it. I have found it of little use to have the patient force down his piles before the anæsthetic is administered, inasmuch as they are very apt to slip into the bowel again as the sphincter becomes relaxed; but I prefer that the patient should rinse out the bowel by an enema of tepid water, before he takes his place upon the couch or table. This latter should be firm, narrow, of convenient height, and in a good light. As soon as the patient is fully under the influence of the anæsthetic, I have him placed in Sims's position for operation on the uterus and vagina, that is, with the upper part of the body prone, the hips elevated, and the thighs flexed on the abdomen. There should be an assistant to take entire charge of the administration of the anæsthetic, and at least one more to aid the operator.

"I then commence the operation by thorough and complete *forcible dilatation* of the sphincter-ani muscle, by which the interior of the lower part of the rectum is placed entirely at my disposition, and afterwards proceed to the ligature of the hemorrhoidal tumours in the manner and with the precautions already described. The paralysis, or to speak more accurately, the atony, of the sphincter muscle, which results from this manœuvre of forcible dilatation—which I will explain more fully another time—secures not only the great advantage to the surgeon of free and ready access to the lower part of the rectum, but it saves pain and trouble to the patient after the operation. The muscle does not recover the full vigour of its contractile power for a week if the manœuvre has been thoroughly accomplished, and meanwhile the patient is spared much pinching of tender parts. I have thought that retention of urine, which sometimes follows the operation for internal piles, has been prevented by it.

"As to the question of danger of the operation by ligature: in selected cases, it is so trifling as to be hardly appreciable. In between sixty and seventy operations, I have never had an unpleasant result. In over one hundred cases of operation by ligature, the late Valentine Mott had one fatal result—in a gentleman 'who had just before met with great reverses in business.' From the symptoms as recounted, I infer that the cause of death, in this case, was suppurative phlebitis, as he 'fell into a typhoid condition' shortly after the operation, and 'small abscesses were found in the liver after death.' I have knowledge of one other case where a similar result followed a partial operation; the patient, a medical man, having subjected himself to exposure and over-fatigue within a day or two afterwards."

Dr. **Bodenhamer** uses "almost exclusively" a silk ligature; he declares

"It is seldom that my patients, during the whole course of treatment, are ever confined for a moment to either their rooms or their beds, but are enabled at all times to be up and attend to ordinary business."

"The old method of tying piles, that which is recommended in the books, taught in the schools, and usually practised, is (after the bowels have been evacuated and the tumours protruded as much as possible) to seize each tumour by either tenaculum or forceps, and draw it down fully out of the anus, and apply closely to the base of the part thus drawn down, a strong heavy silk or hempen cord, and then the same drawn and tied as tightly as can be; or a curved needle, armed with a double ligature, is passed through the base of the tumour, so as to divide it into two, and the cords tied as tightly as possible on each side. After the tumours are all tied, they are returned within the anus, and an enema of starch and laudanum administered, the patient required in the meantime to maintain the horizontal posture, to live on meagre diet, and to avoid having any fæcal evacuation for six or eight days. Sometimes immediately tying the tumours, they are then amputated closely to the ligature. This, in short, is the usual process now practised in the ligation of hemorrhoidal tumours, and, from the very nature of the case, must necessarily be attended with more or less danger, and with severe pain and inconvenience.

"The great objection to this method of operating is, the extreme suffering which follows and continues for a considerable time, and the confinement to either bed or room for several days. It is said, too, by some authorities, that the operation is attended with great danger from *tetanus*, *phlebitis*, or *pyæmia*, &c. This danger, however, has been, and is, in my opinion, greatly exaggerated. The few fatal cases reported were never verified by a *post-mortem* examination, and consequently are deserving of but little confidence. I believe when danger, extreme pain, or failure attends the operation, it is generally referable to the unsuitableness of the ligature, and the injudicious manner in which it has been placed upon the tumour. I have, by my peculiar method, operated in thousands of instances, and have yet to encounter the first serious accident.

"The circumstance, then, of the danger, pain, and inconveniences attending the old operation, led me, about twenty-five years ago, to seek for information in relation to it, with a view if possible to remove some of the obnoxious features of it, or so to modify it as to make it less objectionable and serious, without at the same time rendering it any less efficacious in the cure of the disease. I first began by making some experiments upon both internal and external hemorrhoidal tumours, when in a quiescent state, expressly with a view to ascertain whether any one point or portion of the tumour was more sensitive than another; and more especially whether the mucous membrane, or other tissues from which such tumour proceeded, was more or less sensitive than the tumour itself or its covering. The experiments were conducted by means of a peculiar forceps, expressly made for the purpose. The apex of the tumour was first seized by the instrument, and firm compression made; the middle portion next, then the base, and lastly a portion of the lining membrane of the rectum, to which the tumour was attached, was included in the blades of the forceps. I found that in proportion as the compression reached the base of the tumour the pain was increased, and when a portion of the mucous membrane of the rectum or other tissue was included in the blades of the forceps, the pain was very severe. I have ever since, in operating, been very careful so to adjust the ligature as not to tie it too close to the base, and that nothing but the tumour itself should be included in its grasp. Now the question naturally arises, what is the cause of this difference in the sensibility of the natural textures from which the tumour proceeds, and those of the tumour or foreign growth itself? The most rational inference which occurs to my mind at present is, that the former are more abundantly supplied with nerves and nervous influence than the latter. Be this as it may, however, the fact is as I have stated it, and it is in the power of any student to verify it. But on this, as on many other points of pathology and physiology, we are sometimes much better acquainted with the *quo* than with the *quomodo*; in other words, we know the facts, but we cannot well explain them. My researches on this subject have plainly taught me that so far as the natural tissues are concerned, the fine and delicate skin immediately without the anal orifice is the most sensitive; that the muco-cutaneous coat immediately within the anal orifice is next in point of sensibility, and that the mucous membrane of the rectum is the least sensitive of the three. I, however, have found the mucous membrane of the rectum much more sensitive than the mucous membrane covering the tumour. This must not be forgotten. Indeed, the foreign body and its covering, unless entirely external and covered with true skin, are much less sensitive than the three natural textures previously named.

"I now propose to offer some improvements in the operation of ligating hemorrhoidal tumours, the success of which has been invariable, and warranted by an experience of twenty-five years.

"By my method of operating, the tumour to be ligated is never seized by tenaculum nor forceps, and pulled down; for if this is done, a portion of the elastic mucous membrane of the rectum, to which the tumour adheres, also comes down with it, and therefore is almost certain to be included in the grasp of the ligature—hence the additional pain and suffering which necessarily follow; for the operator cannot distinguish the true base of the tumour from any other part when drawn down in this manner, for all the parts generally have the same appearance. I always require my patients to extrude the tumours simply by defecating efforts, or by the efforts produced by means of an aperient or a relaxing enema. If one or all these means should fail to protrude the tumours, I employ a bivalve speculum ani, introducing and arranging it in such a manner that the tumour which I design to ligate should fall between its blades; then, with suitable instruments, it can be ligated within the canal, just as easily as if it were extruded or external. I scarcely ever take up more than one tumour at one time, and never employ a heavy silk cord with a hard twist in it, such as saddler's silk, which is the article often used for this purpose, but use a fine silk ligature, well waxed, with scarcely any twist in it, somewhat like floss or dentist's silk; for in proportion to the size of the ligature and the hard twist in it, will be the increased pain it will occasion, and the length of time it will take the tumour to slough off. As before observed, I am careful so to adjust the ligature as to exclude everything but the foreign body itself, and only make the ligature sufficiently tight to cut off the circulation—nothing more nor less. This can be known and adjudged by the appearance of the tumour whilst the ligature is being tightened. I am also careful not to place the ligature very close to the base of the tumour, as this produces more pain, and is not any more effectual in removing the whole of it. The small portion of the base of the tumour being below the ligature, will also sooner or later completely slough off. When the tumour is very large, or too large for one ligature, I divide it into two or more sections, according to its size, and multiply the ligatures, including but a small portion of the tumour in each. This is done by arming a suitably curved needle with a double ligature, passing it through the base of the tumour, and, if necessary, repassing it, and tying each ligature separately—thus including in the stitches every part of the tumour, and underlaying it, as it were, with a double uninterrupted suture. When part of the tumour is covered with true skin, or muco-cutaneous tissue, I usually incise this upon the same circle which is to receive the ligature afterwards, by which more or less suffering is avoided. I sometimes, when the tumour is entirely external and covered with true skin, and objection made to the knife or curved scissors, ligate it subcutaneously, which causes it to shrivel and gradually to disappear."

Mr. SMITH, on the other hand, although he admits that the application of the ligature has proved to be admirable and permanent in its results, ardently advocates the use of the clamp, for as regards the ligature—

"It was found that there were many disadvantages connected with it, and that it would be desirable if some other means of treatment equally efficacious could be put in force.

"About thirty years ago Mr. Cusack suggested the employment of the clamp and cautery as a means of destroying hemorrhoidal tumours, and his practice was followed by other surgeons in Dublin. In this country Mr. Henry Lee adopted the method of using the clamp, cutting off the tumours, and then stopping the hemorrhage with the actual cautery. The results of this gentleman's experience induced me to put the plan in force, and in the first cases which occurred in my practice I was so satisfied with the treatment, and so convinced of its superiority over the ligature, as regards the important elements of safety to life, freedom from suffering, and saving of time, that I determined to treat in this method those cases, both of hemorrhoids and prolapsus, where I thought the ligature was inadmissible, or where the patient objected to it, as well as those wherein the application of nitric acid alone would not suffice to bring about a cure.

"I was not long, however, in finding out that the clamps hitherto used were capable of being greatly improved, for these were either of an awkward shape, were so constructed as regards the apposition of their edges, and so totally unfurnished with regulating power, that the efficiency of the instrument and value of the treatment were much impaired; so I suggested to Mr. Matthews to make me an instrument shaped somewhat like the ordinary clamp Mr. Curling uses for applying nitric acid: but the edges, instead of being serrated, or not meeting in their entire length, as in an instrument used by Mr. Henry Lee, were to be so constructed that they accurately fitted their whole extent by means of a groove on one blade and a raised surface on the other. I soon found the value of this, for the mucous membrane or tumour to be removed could be thoroughly compressed, and there was no fear of the bleeding which would take place when the clamps with serrated edges were used and the tumour excised. I next improved the instrument by furnishing it with a catch, and by this I was greatly assisted; but when the pressure was taken off the divided base of the tumour the cut surface would suddenly recede from the grasp of the blades, and if some vessel not thoroughly cauterised should bleed, it was difficult to get hold of the part again; so, to meet this emergency, I had a light but powerful screw added to the handles of the instrument, by means of which I could so regulate the power of the blades as to take the pressure off the cut surface of the rectum gradually, instead of suddenly, so that if any portion of the divided surface was not thoroughly cauterized the bleeding point would show itself, although still retained within the grasp of the blades, and by the slightest turn of the screw it could be secured and the bleeding vessel be entirely sealed up. This addition to the instrument I consider to be of the utmost importance, and, indeed, I never think of performing an operation without employing the instrument furnished with the screw.

"The operation, whether for hemorrhoids or prolapsus, is very simple, and consists of the following manœuvre:—The diseased portions, being well brought down previously by an injection, are separately seized with a vulsellum and handed to an assistant. The part is then enclosed within the blades of the clamp, which are screwed home quickly and thoroughly; the prominent portion of the pile or prolapsus is then cut away by a sharp pair of scissors, the cut surface is next dried by a piece of lint or sponge, and either the strong nitric acid or the actual cautery, so shaped as to come into contact with the whole of the raw tissue, is applied; when this is effected the blades are gently and slowly unscrewed, and if there is no bleeding the part is well oiled and allowed to return within the cavity of the gut; if, however, any bleeding point is seen, the blades are quickly screwed together, and the cautery is applied until the vessel be thoroughly sealed up. The finger is then introduced well up into the rectum. This step serves the triple purpose of returning all the parts well, of compressing any point which might possibly bleed, and of exciting the sphincter to healthy action. I generally introduce at the same time a suppository of opium.

"Now, it might appear to some that this operation would be very painful, but, singular to relate, if great care be taken not to include any of the integument within the blades, and not to allow the nitric acid or cautery to come into contact with it, the patient does not feel much pain, and really does not know when the heated iron is being applied. If, however, the cautery be kept in contact with the blades of the clamp for more than a few moments, the patient will suffer pain by the transmission of heat through the contact of the metallic surfaces, and therefore it has been suggested to me to have some non-conducting medium applied to the under part of the blades. It is possible that I may make some alteration in this presently; but a grave objection lies in the fact that by this means the size and thickness of the blades would be materially increased."

Mr. Allingham describes the mode of treating hemorrhoids by the ligature as applied at St. Mark's Hospital, after the manner devised by the late Mr. Salmon. Expressing his opinion that ligature is by far the best and most generally applicable method of operating upon hemorrhoidal diseases, he guards against being understood as referring to "the usual method of applying the ligature by transfixion of the base of the pile and tying it in halves." The operation he recommends is as follows:

"The hemorrhoids are to be seized by the operator one after another with a vulsellum or pronged hook-fork, and drawn down; he then with a pair of strong sharp spring scissors separates the pile from its connection with the muscular and sub-mucous tissues upon which it rests; the cut is to be made in the sulcus or white mark which is seen where the skin meets the mucous membrane, and this incision is to be carried up the bowel and parallel to it, to such a distance that the pile is left, connected by an isthmus of vessels and mucous membrane only.

"There is no danger in making this incision, because all the larger vessels come from above, running parallel with the bowel, *just beneath the mucous membrane*, and thus enter the *upper part* of the pile. A well-waxed, strong silk ligature is now to be placed at the bottom of the deep groove you have made, and the assistant then drawing out the pile with some decision, the ligature is tied high up at the neck of the tumour as tightly as possible. *If this* be done, *all the vessels must* be included. The silk should be so strong that you cannot break it by fair pulling. A portion of the pile may now be cut off, taking care to leave sufficient stump between the ligature to guard against its slipping. When all the hemorrhoids are thus tied, they should be *returned thoroughly* within the sphincter; after this is done, any superabundant skin which remains apparent may be cut off; but this should not be too freely excised for fear of contraction on the healing. An injection of liq. opii sedativus may be administered. I always place a pad of wool over the anus, and a tight T-bandage, as it relieves pain most materially."

One very important practical point Mr. Allingham adds,

"I am quite convinced that the higher you carry your incision up the bowel the less does the patient suffer, because the ligatures are removed from the most sensitive part of the rectum and lie quietly above the sphincters."

In opposition to Dr. Bodenhamer as quoted, Mr. Allingham urges rest after the operation. He says,

"I think it advisable, though not absolutely necessary, that the patient should keep lying down until the ligatures separate, which almost invariably takes place about the sixth or seventh day, occasionally a day sooner, very rarely a day later. If the ligatures are tied tightly and the incision has been free, this course of events is but very seldom departed from. *Active exertion*, even after the separation of the ligatures, is to be deprecated until the sores left in the rectum are quite healed; a fortnight or a little longer is generally about the time required to accomplish this. It is quite unnecessary that the patient should be kept in bed all this time, or even to his chamber—he may move about in moderation; but I am quite certain that a too speedy resumption of the erect position is likely to retard the cicatrization of the wounds."

Under five heads, advantages are claimed by Mr. Allingham for Mr. Salmon's operation as performed at St. Mark's Hospital:

"1st. The rapidity with which it may be executed. I have often operated upon four or five hemorrhoids, returned them, and removed redundant skin in one minute and a half or two minutes.

"2d. There is only a very small amount of tissue included in the ligature; in fact, little more than the vessels supplying the tumour.

"3d. At least three-quarters of the wound is a simple incised wound which heals rapidly, only the small portion included in the ligature having to slough away.

"4th. The ligatures are tied a considerable distance from the anus, so that, when returned into the bowel, they lie above the internal sphincter, where the sensibility of the mucous membrane is not acute, and consequently the pain and irritation after the operation is reduced to a minimum.

"5th. The operation is wonderfully free from danger to life, and its results generally are almost always satisfactory."

Mr. Allingham combats Mr. Smith's statements in praise of the clamp and cautery, which he stigmatises as "extravagant," and declares that he has seen a much greater proportion of untoward results from the clamp than from ligature, not only in his own practice, but in that of other surgeons; that the suffering after the operation is very considerable, the patient not being more free from spasm of the sphincter and retraction of the levator ani than after ligature; and that a good many times he had been annoyed after the clamp operation, to find that his patient had slight but recurring arterial hemorrhage.

The clamp, then, would appear to be admissible in those cases of internal hemorrhoids where the tumours are not numerous, and where especially there are no external piles or hypertrophic skin requiring removal. That the ligature is the safest and most effectual remedy, the opinion expressed by Mr. Curling in 1863, is thus supported by subsequent testimony.

The clamp has another antagonist in Mr. Ashton, who declines to admit its advantages; he further adds that there is "the impossibility of including between the two straight lines formed by the jaws of the instrument, so irregular a growth as that constituting the base of a hemorrhoidal tumour, and which is also frequently attached as high as the upper margin of the internal sphincter."

Mr. Ashton figures curved needles, having a cutting edge on the concave border, and furnished with two eyes, so that after the section of the anal attachment of the pile, the needle being driven through its base from without inwards, both eyes may be threaded with "ligatures of gold thread made of longitudinal strands of silk bound round by a spiral band of fine gold." On the withdrawal of the needle, the two ligatures occupy its place, and can be tied, one on each half of the tumour transfixed. Mr. Ashton strongly impresses the necessity of drawing the ligatures as tightly as possible and of including the whole of the tissues affected, differing from Mr. Curling, who states that the contraction of the cicatrix is sufficient to reduce any part that may have escaped the ligature. Mr. Ashton thus follows the practice of Mr. Quain at University College Hospital. Mr. Ashton's needles probably afford a convenient instrument for landing the double ligature.—*British and Foreign Medico-Chirurgical Review, Oct.*, 1872, *p.* 309.

49.—CASES OF STRICTURE OF THE RECTUM TREATED BY DIFFERENT METHODS—ONE OF THEM BY ELECTROLYSIS.

By Dr. William R. Whitehead, Physician for Diseases of Women at the North-Western Dispensary, New York.

The unsatisfactory results which so often follow the ordinary treatment of stricture of the rectum, is a sufficient reason to call attention to the following cases. They illustrate in a comparative manner the value of certain modes of treating this disease, which is confessedly a very distressing one, and exceedingly difficult to manage. It is proper, however, to preface the relation of these cases by the statement, that I believe that the most effectual way to cure fibrous stricture of the rectum is by a thorough division of the stricture posteriorly, and by dilatation afterward by means of elastic pressure, such as I have described in a preceding number of this Journal (*American Journal of Medical Sciences, Jan.*, 1871).

Case 1.—Mrs. F., a very intelligent lady about forty-two years of age, consulted me at the suggestion of Dr. Wm. George Thomas, of Wilmington, N. C. For a number of years she experienced much distress and difficulty in relieving her bowels; but was not aware of the presence of a stricture of the rectum until examined by Dr. Thomas about twelve months previous to the time at which I first saw her. He was of the opinion that the stricture was not cancerous, and this opinion was strengthened by a microscopic inspection by Professor Leidy, of Philadelphia, of some of the dejected matters which were sent to him for examination.

On the 15th of May, 1871, after she was thoroughly etherized by Dr. F. H. Deems, I made a careful examination of the rectum and contiguous parts. There was a tight stricture of the rectum more than an inch in length, and which extended from opposite the lower part of the Douglas cul-de-sac upward, and above it. A considerable mass of indurated tissue formed the stricture anteriorly, and occupied a very extensive relation with the peritoneal covering of the rectum. Mrs. F. informed me that she had for ten or twelve years worn a pessary in the vagina, and that she had once worn this instrument about a year without removing it. She was disposed to attribute the stricture to inflammation caused by the long continued pressure of the pessary against the rectum, and I am quite inclined to adopt this opinion. The case appeared to be a formidable one for operation, and not being at that time so well convinced of the necessity of a thorough section of the stricture as I am at present, I was undecided whether to cut or rupture it.

However, believing it necessary to resort to either one or the other of these procedures, in order to obtain subsequently a desirable degree of dilatation, with the elastic pressure, which I believe to be the safest method of dilatation, and an effectual one for the treatment of most cases of stricture of the rectum, on the 18th of May, assisted by Dr. J. B. Landeta, Dr. Francis H. Deems, and my present clinical assistant, Dr. A. Landeta, I ruptured the stricture with Sims's dilator, and completed the rupture with my index finger, having directed my force principally against the posterior wall of the gut. The rupture was made without difficulty, but I was apprehensive about the extent of this rupture and the danger of laceration of the rectum. This danger I do not believe to be overrated; and since I have quite satisfied myself about the safety with which a deep incision of the rectum may be made posteriorly, I prefer incision to rupture of a stricture except when seated quite near the anus. After the operation a piece of sponge about the size of a small orange and with a string attached was readily passed up the gut beyond the previous seat of stricture, so that the part could be well seen with Sims's speculum by all present. At the time of this operation, I was unaware of the existence a short time before, of a slight subacute peri-uterine inflammation. The knowledge of this condition gave me considerable solicitude about the safety of the patient. She had some peritonitis, which was controlled, however, with morphia in fractional doses given at intervals. The use of the duck-bill speculum caused a fissure of the anus, which was cured by rupture of the sphincter ani muscle with the fingers. The peritonitis interfered with the immediate after-treatment by dilatation, but after six or eight days she used very effectively the instrument which I have recommended for elastic dilatation, but which has been so modified as to be much preferable to that first used. Four, five, or six rubber condoms one over the other, and properly adjusted to the instrument, will offer as much resistance as a stout Barnes's dilator, and are much easier to introduce either by the patient or by the surgeon. The probe which is attached to the instrument, and which is inside of the rubber bags, should be made of whalebone, and should be of the requisite degree of flexibility, and covered with a piece of rubber tube about the eighth of an inch in diameter. The tube protects the whalebone from the water, which would soon soften it and make it worthless as a director. There is no difficulty about the use of this instrument in the hands of an intelligent patient when once shown how to adjust properly the condoms to the instrument, and to its directing whalebone staff. A single rubber bag sufficiently stout would appear to be much preferable: but attempts have been made by instrument-makers of this city to make such bags for me for this purpose, but there has always been some defect about them, which made them dilate very unequally, and burst at one of the seams or elsewhere. Rubber condoms or capotes can be obtained anywhere; they are used by oculists for ice-bags, and, introduced into the natural cavities of the body and distended with ice water, are useful for stopping hemorrhage. Half a dozen condoms, properly adjusted one within the other, and distended with water by means of a Davidson's syringe attached to a tube with a stopcock, I have found to be a good way to treat vaginismus after section of the vaginal sphincter, or even when cutting of this sphincter is not required.

It is very important to wash out the rectum three or four times a day with carbolized injections. A lacerated wound or cut of the mucous membrane of the rectum, constantly bathed with excrementitial matter and with pus, becomes without this means a great source of danger from septicæmia. During the latter part of July I received from Dr. Thomas a letter from which I make the following interesting extract:

"The lower part of the stricture is decidedly relieved, the upper part not so completely. She has devised a modification of your capote dilator which struck me with force, and I think will answer an admirable purpose. She puts a silk bag between the rubber capotes, and ties them to the guiding staff. The silk bag may be stretched to its utmost capacity, and is firm, and is well protected from both the injected fluid and the secretions of the rectum by the condoms. It operates well, and upon trial I think you will be pleased with her ingenious improvement. She has used the dilator daily since she left New York. I advised her to use it once every three or four days only, during two to four hours at a time, and to gradually enlarge the silk bag."

The width of the silk bag, a paper model of which Dr. T. sent to me in a letter, is two and a quarter inches. In a letter from the patient dated December 16th, 1871, more than six months after the operation, she stated that she uses the dilator quite frequently, and that her physician recommended her not to use it oftener than once in two or three weeks. She stated that her appetite was excellent, and that she was able to attend actively to her household matters; she had gained flesh, and all of her friends had observed and remarked upon her improved condition. We believe that a rather frequent, but judicious and long-continued, use of the elastic dilator in such cases to be very necessary.

Case 2.—Last summer Dr. A. Worthington, of Ontario, Canada, consulted me by letter relative to Miss M., who had stricture of the rectum of a number of years' standing, and which was complicated with a recto-vaginal fistula. The parents of the lady, by advice of Dr. W., their family physician, requested me to visit her at her residence near the village of Wroxeter, in Canada West, and, if necessary, to perform such an operation on the stricture as the necessities of the case might require. Miss M. was thirty-four years of age; I found her anæmic, greatly emaciated, exceedingly inanimate and taciturn in her manner. I was much discouraged by the appearance of her general condition. Menstruation had ceased about two years before she consulted me, but previously it was regular. During two or three years there were discharges of bloody water from her bowels, together with lumps which her mother said resembled fat meat. During a period of four years she had occasional hemorrhages from her bowels; altogether nine or ten in number. During the last three years her health had gradually declined. July 12th, 1871, the day on which I first saw her, assisted by Drs. Worthington and Byron Crandell, of Clifford, she was etherized, and I made a careful examination of the rectum, which revealed by the vaginal touch a very indurated cervix and a recto-vaginal fistula on a level with the posterior lip of the cervix. The fistula admitted with some constriction the end of the index finger. The uterus was normal in size, but bound down posteriorly by adhesions. The rectal touch discovered two strictures with the recto-vaginal fistula between them. The lower stricture was inconsiderable in size, and was situated immediately above the sphincter ani muscle. The upper and principal stricture was seated three inches higher up the gut. The walls of the rectum between the strictures were firm, rigid, and posteriorly were slightly *nodulated* and suggestive of an interstitial malignant deposit. The upper stricture admitted the end of the index finger. While the patient was under the influence of ether and in the semi-prone position, I tore the stricture posteriorly with the index finger of the right hand hooked into it. With two fingers of each hand I ruptured the sphincter ani muscle, and at the same time the indurated tissue of the rectal wall just above the sphincter. I then felt a fibrous band running somewhat obliquely across the posterior part of the upper stricture. I cut this band with a small knife which was concealed within, and could be projected at will from a flattened sheath. The whole stricture immediately yielded, and by means of Sims's speculum, nearly the whole of the lower part of the rectum was plainly brought into view. The cut was made on the median line and posteriorly. There was not a teaspoonful of blood lost during the operation. The danger in this case was from peritonitis and septicæmia. The first I believe could be controlled by the appropriate use of morphia; the second could be prevented by washing out the rectum several times a day with carbolized injections. During the first twenty-four hours she was inefficiently nursed, and took the morphia very irregularly. She was allowed several times to sit up and strain at stool for one or two hours at a time, after which she was very much exhausted. When I saw her the next day, I urged the parents not to allow her to sit up, but to have a bed-pan put under her when required, and to procure immediately, if possible, an experienced nurse. During the second night after the division of the stricture she had an alarming collapse, and vomited once. She was resuscitated by the application of hot bricks to her feet and by teaspoonful doses of brandy and water. I remained at the house with her during the night and part of the following day.

On the 14th of July a good nurse was obtained, and the pulse, which had been at 140, under the influence of a solution of sulphate of morphia regularly given fell to 120, and the patient's condition was better. There was not so much tenderness about the lower part of the abdomen. The mother persisted occasionally in giving the patient her medicine, and instead of a teaspoonful of a solution of morphia which contained the one-eighth of a grain of this substance, gave by mistake a teaspoonful of a saturated solution of carbolic acid. This was used largely diluted with water to wash out the rectum. Dr. Crandell was in the room at the time that this mistake occurred, and Dr. Worthington and myself were in the adjoining room. The whole interior of her mouth was blanched, and she experienced very great distress in swallowing some milk which I requested her to drink immediately. After a few hours the pulse ran very high, and the distressed feeling about her mouth and throat increased, and she died about twelve hours after the swallowing of the carbolic acid, which contained only five per centum of water. I regarded this case as a very unfavourable one, and which possibly under different circumstances I should have declined to operate upon. But it was quite evident that her only chance to obtain any relief was in a careful division of the stricture or by its rupture in the manner in which I effected it, to be followed by methodical dilatation with the rubber bag distended with water. She had commenced under better nursing rapidly to improve, and would I believe have recovered had she not swallowed the carbolic acid.

Case 8.—The following case is interesting from the fact that several attempts were made to disperse, by electrolysis, the interstitial deposit which formed an indurated mass that caused the stricture of the rectum.

Mrs. K. consulted me at my clinic at the Northwestern Dispensary more than eighteen months ago, for stricture of the rectum. The stricture admitted with difficulty the end of the finger, and extended from opposite the Douglas cul-de-sac, upward above it, and beyond the reach of the finger. The stricture was unmistakably the result of syphilitic ulceration of the rectum, and the patient had a secondary eruption on the skin. This eruption, under appropriate treatment, disappeared, but reappeared once or twice, and she, at present, has an ulceration of the leg of syphilitic appearance. Soon after I first saw her, she was etherized, and the stricture was cut with a curved bistoury anteriorly, and posteriorly at its lower part; but as I could not reach the upper part of the stricture with my finger, the operation was necessarily incomplete. The knife was securely wrapped, except near its point, with cotton, and the cutting part was well protected by the end of the index finger of the right hand. Attempts were irregularly made to dilate the stricture with the rubber bags, and by forcible dilatation with the finger. I held in reserve, however, this case for another cutting operation, and decided that I could safely make a very extensive incision, if required, on the posterior wall of the rectum. My opinion in this matter was strengthened by a careful examination of two or three cadavers with reference to the relations of the peritoneum to the rectum. Besides, Professor Darling, of this city, professor of anatomy in the University Medical College, kindly called my attention to a dried specimen which well illustrated these relations in a manner usually overlooked by anatomists. An incision made posteriorly, at any point along the median line, from just below the promontory of the sacrum, and between the folds of the meso-rectum to the sphincter ani, will not wound the peritoneum, or be likely to be followed by hemorrhage. But the peritoneum covers the sides of the rectum quite low down, and the peritoneal duplicature of the utero-sacral ligaments in relation also, anteriorly with the rectum, may, especially in partial prolapsus of the uterus, draw the peritoneum unusually low down on the sides of the rectum.

I was attracted to the use of electrolysis in the treatment of strictures of the urethra by Tripier's article in the *Arch. Gén. de Médecine*, and besides, I was invited by Dr. Robt. Neuman, of this city, to see with him a patient, with stricture of the rectum, and to which he made one application of electricity with Stöhrer's battery of sixteen elements, and subsequently used my dilator for elastic pressure. I am not quite sure which electrode Dr. Neuman applied to the stricture. As an immediate result of this application the stricture was considerably dilated. Quite recently a post-mortem examination of the case afforded Dr. Neuman an opportunity to exhibit to the New York Pathological Society the rectum of this patient. It seems that, having obtained some relief, she became careless and neglected herself; finally she got worse, and had fecal fistulæ to form. The specimen shown to the Society interested me exceedingly, but I was unable to draw any definite conclusions from the appearance of this specimen, as to the value of electrolysis in the treatment of strictures of the rectum. However, I had, after having seen Dr. Neuman's case, obtained Dr. Wm. B. Neftel's co-operation in the electrolytic treatment of the stricture of Mrs. K., the subject of the third case, and which I am now reporting. The electrolytic treatment of this case extended over a period of one month, and during this time four applications of electricity were made. All other kinds of treatment were purposely avoided, so that the electrolytic action might be well tested. The patient was not etherized, and the first application was made with a new galvanic battery of Curt Mayer, of New York (a platina-zinc battery). A cathode made for the purpose, consisting of hard rubber and a solid brass cylinder rounded at the end, was introduced by me partially into the stricture. Dr. Neftel commenced with one element, and increased gradually, one by one, to twenty elements. There was a slight and gradual increase of pain. A current of twenty elements was maintained for fifteen minutes. I repeatedly examined the part during this time. The applications lasted about half an hour. There was an immediate dilatation of the lower part of the stricture only.

On the 16th of January, 1872, a week after the first application, another one was made with Remak's battery. Dr. Neftel thought that it would be well to isolate with shell-lac, or hard rubber, the rounded end of the brass cathode. It was isolated at its end with shell-lac, and introduced by me into the stricture. The anode, in the shape of a flat disk, and separated from the skin by a piece of wet cloth, was, as in the preceding application, applied to the hip, and shifted about from place to place, when the heat developed at the anode, or positive pole, became unendurable. The application began with two or three elements, and was gradually increased to fifteen, at which number the current was maintained for five minutes, with a deflection of the needle of the galvanoscope of fifteen degrees. The current was then gradually, by the addition of one element at the time, increased to twenty-one elements, as denoted by the position of the winch in the current selector. A current of twenty-one elements was used during five minutes; it was then interrupted, and I examined with my finger, and found that the upper part of the stricture was considerably dilated. The circuit was again closed, and the cathode re-applied to the central part of the stricture. The applications this time lasted altogether fifteen minutes, and the patient afterward did not feel uncomfortable. Possibly it may be well to observe that Dr. Neftel used the elements of Siemens, which were substituted for Remak's elements, and were contained in the box of Remak's apparatus. It appears to me that, for accuracy of observation, it would be desirable to adhere to the use of one apparatus.

January 24, a third application was made. Previously the patient stated that her bowels were more easily moved, and an examination revealed that the stricture was more dilated. A brass cathode, insulated at its end with hard rubber, was introduced into the stricture, and the anode applied to the external part of the thigh. Twenty-three elements of Siemens were used during twelve minutes, with a deflection of twenty-three degrees of the needle of the galvanoscope. Twenty-one elements were used for eight minutes longer. A considerable quantity of frothy mucus, caused by the evolution of hydrogen at the cathode, issued from the rectum. The applications this time lasted altogether twenty minutes. After the discontinuance of the current I found that the upper part of the stricture was much dilated, but that the middle part was still constricted. A week later, another application of electricity was made much in the same manner as this one, but of which I failed to keep any notes. I decided not to use dilatation after these applications, but to permit a few months to elapse before I examined her. I believe this was also Dr. Neftel's suggestion.

April 16, 1872, she came to the Northwestern Dispensary, and was carefully examined by my clinical assistant, Dr. A. Landeta. The stricture with difficulty admitted the end of the index finger, and was quite as tight as before the electrolytic treatment.

Possibly it may not be out of place, in connection with this case, to attempt to define what is meant by electrolysis as applicable to the dispersion of certain tumours, or of the induration of the tissues, as in stricture. The different effects of the two electrodes on the living tissues, should be distinguished one from the other. These effects are modified by the use of batteries of great electro-motor power, or of feeble power, or composed of many small elements, but of great tension. It seems to me that a multitude of different circumstances influence the effects of the currents. The kind of electrode used; such as needles, blunt or flat electrodes, and these last with or without moisture, modify the effect. The moving of the electrodes, and, if needles be used, the position in which they are stuck into the flesh, whether parallel or in a line continuous with each other, are also worthy of attention. The effects must necessarily differ widely, because, if, as in the last case, the needles intersect, or are continuous with each other, especially should their points be near together, we may have a bad slough of the tissues in the place of a resolutive or electrolytic action, such as is supposed to occur at the cathode of a galvanic current, under conditions favourable to the development of the peculiar effects of the negative current at this pole. It is not at all my object to discuss the subject of electrolysis, but I, probably in common with many others, would like to know what is its practical value, and also something about the right indications for its use, and the proper manner to develop the electrolytic action.

It is necessary, it seems, to distinguish well the decomposing power of the current from its heat-producing power. The chemical and decomposing power, or electrolytic effect, is supposed to take place at the cathode, and is caustic in its action, but caustic after the manner of alkaline caustics. The heat-producing power of the current is developed at the anode, at which may be produced a disorganization of the tissues immediately around it, similar to that caused by the actual cautery. If the anode be a thickly plated gilt needle, thrust into the tissues, it will be corroded by oxidation, and there may be considerable difficulty in withdrawing it. The disorganization of the tissues immediately around the needle will be proportional to the greater or less intensity of the current. If the cathode, or negative electrode, be also a needle, and thrust into the flesh, no corrosion of this needle occurs, but soon the tissues around it will become emphysematous by the escape of hydrogen. An alkali is evolved at this electrode, and an acid at the other. It would seem that there occurs a mechanical disassociation of the tissues by the action of the escaping hydrogen, and a dissolving and fluidifying effect caused by the alkali liberated at the cathode. If the anode be a plate or disk, the heat may be so great as to burn the patient severely. It should be recollected that the positive electrode is at the end of the wire which leads from the negative metal, and the negative electrode at the end of the wire which leads from the positive metal, and which would be the zinc, if this be used, in a zinc and copper battery.

The direction of the positive current is from the metal oxydized to that which is not, and the direction of the negative current is the opposite. Tripier's experiments on strictures of the urethra gave immediate results which were seemingly satisfactory. The strictures in each case after the application of the cathode were enlarged, but their condition a few months afterward is not stated. He concludes that the negative galvano-cauterization, or that obtained with the cathode, is an excellent substitute in certain cases, for the caustic of Filhos, and that the cauterization obtained with the anode may replace that of the strong acids, or the actual cautery. He claims that the cicatricial tissue which results from cauterization with the cathode is soft, thin, and not resilient, and that the inodular tissue produced at the anode has the usual character of such tissue. The greater the electro-motor force of the battery, the more rapid, and the more painful will be the cauterization. Whichever electrode is selected for cauterization, the effect would be, apparently, to burn a larger hole through the stricture, and it seems to me that dilatation should be used afterward in order to obtain any benefit from this mode of treatment.

Case 4.—As an example of stricture of the anus and lower part of the rectum, caused by the injudicious application of caustics for the cure of hemorrhoids, the following case may prove interesting.

Through the recommendation of Dr. Horace P. Farnham, of this city, a gentleman from one of the Western States recently consulted me for an intolerable itching about the anus, and for great difficulty in evacuating his bowels. There were hard and slightly elevated folds of the integument immediately around the anus, and on introducing the finger into the rectum, the tissues about the anus felt very much indurated, and formed a tight stricture at the anal orifice. On remarking to him that probably some caustic application had been made to the parts, he replied that a few years ago he was treated for hemorrhoids by several applications of caustic, and that he had since noticed a gradually increasing difficulty in relieving his bowels. I told him that gradual dilatation was, in his case, the only safe and effectual means of relieving him, that division of the sphincter ani, at present at least, was unnecessary, and that dilatation would also afford him relief of the itching. I advised him to have a number of smooth and slightly conical plugs about two inches long, made of maple wood, each with a handle, and also with a flange, to prevent it from slipping too far into the rectum. These plugs should be graduated in size, from that of the finger to that of the largest bougie.—*American Journal of Medical Sciences, July*, 1872, *p.* 114.

50—ON REMOVAL OF THE TONGUE FOR EPITHELIAL CANCER.

By John Wood, Esq., F.R.S., Surgeon to King's College Hospital.

Up to the present time the operation for the removal of the tongue or any part of it has been considered by most surgeons as one of those in which the blessings of anæsthesia could not with safety be afforded to the patient, for reasons which will be at once apparent—viz., first, the removal by the anæsthetic agent of the voluntary assistance which the patient can render in all operations upon the interior of the mouth, by keeping the jaws and mouth wide open and the tongue steady; and secondly, the supposed danger, in profuse bleeding into the pharynx, of suffocation by the blood passing into the larynx and trachea. It is very evident that if we cannot in these cases offer to our patient a means of relief unattended by immediate pain, and that of a most severe character, at least half of the advantages of, and inducements to, the treatment involving such an operation are thrown away, and patients will be naturally indisposed to listen to the only promise of relief which can honestly be held out to them. If, then, we can render by any means the necessary operations painless, we confer, I think, a boon upon humanity not by any means small to the poor creatures thus afflicted.

By the use of an instrument made for me by Messrs. Matthews, we obtain a perfect and steady command over the jaws, without encroaching upon or interfering with the cavity of the mouth. It consists of four teeth plates, which act on both sides upon the upper and lower bicuspids by means of a pair of powerful cross levers, placed outside the cheek, and opening independently of each other by a screw on each side through a simple hinge joint. Combined with these levers as they bend into the mouth is a groove to receive the angles of the lips, which are thereby kept wide apart, and out of the way of the light, which is so necessary in securing bleeding arteries in a deep cavity like the mouth. The two sides of the instrument are connected and kept together by a bent piece of metal, which passes under the chin altogether out of the way of the operator, and which is capable of being adjusted to the width of the lower jaw by a sliding groove and fixed by a screw. The whole is held firmly upon the patient by a strap passing around the back of the neck and buckling on to the opposite piece. This instrument has been adopted after a great many trials of different kinds of gags, including that most valuable one for operations upon the palate invented by Mr. Thomas Smith, but which, from the embarrassing presence of the tongue-plate, proved inadmissible in operations upon the tongue. In some respects the present instrument resembles this, and the differences are mainly such as refer to leaving free the tongue and holding the lips well stretched out. I may add that the gag is equally effective in operations upon the tonsils and larynx, and that Sir W. Fergusson employs it, with entire satisfaction, in cases of staphyloraphy.

More difficulty than you would imagine has attended my efforts to get a gag that could be depended upon to resist the struggles of a patient under chloroform, and to meet the ridiculous ease with which the patient, by simply opening his jaws a little wider than the angle at which the gag has been fixed, and at the same time pushing with his tongue and cheeks, as in the act of spitting violently, which so commonly occurs under chloroform, can render nugatory all your precautions to secure a full command over his mouth. The ordinary dentist's gags are often more than embarrassing and worse than useless in these cases. One of the most frequent difficulties arises from the absence of the teeth so commonly drawn to prevent iritation of the tongue on the affected side in these cases. The independent action of the two sides of the gag just described enables one to be opened wider than the other to meet the extra width required by the absence of teeth. A one-sided gag is much more easily displaced by the patient and is more difficult to fix than a double-acting one.

Having thus obtained the necessary control of the movements of the patient's lips and jaws during the insensibility produced by chloroform, we have only to look to those precautions against bleeding and the passage of blood into the larynx which are usually found most efficacious, such as turning the head down to one side and clearing the throat with the finger. If the knife be used the tongue must be held well out of the mouth by a good-sized vulsellum forceps, with hooks sufficiently large and widely placed to prevent their tearing out of the sound fleshy substance of the tongue into which they should be inserted. If the tumour is likely to be very vascular, as may be in some measure divined from its appearance, I have usually passed first a stout ligature across the ranine arteries under the base of the tongue, by means of a curved needle in a handle,—the one, in fact, which I devised for the performance of the operation for the radical cure of hernia. This controls the hemorrhage until the cut ends of the vessels have been secured. The tumour is next seized by a pair of stout double-toothed lion forceps, such as those most useful ones which I now show you, and which we know in this theatre as Wilcox's forceps. I have found these by experience to be less apt to slip than any other I have tried. Then a curved, sharp-pointed bistoury, to transfix the tongue close to its base, and to cut first antero-posteriorly and then laterally across the vessels and nerves, will suffice rapidly to clear away the diseased mass. In securing the arteries much steadiness on the part of the assistant is required. The muscular substance of the tongue is so friable under the circumstances that it is readily broken down by too much vigour in drawing the knot; while the depth at which the cut vessels lie from the surface necessitates dexterity in slipping the thread over the forceps, the points of which should be conical and taper quickly to the end. The proper tying of the vessels, and the prompt application of the tincture of the perchloride of iron and chloride of zinc by a strip of lint tied round a stick, will render the use of the actual cautery rarely necessary to subdue the hemorrhage. It is astonishing how rapidly the patients recover after this operation; and, if too much blood has not been lost, how soon they regain strength and a more healthy appearance. Freedom from pain, undisturbed rest at nights, improved appetite, and revigorated digestive powers account for this satisfactory result.—*Lancet*, *Sept.* 28, 1872, *p.* 441.

51.—TWO NEW FORMS OF ENEMA APPARATUS.

By W. L. Shepard, Esq., late Tutor to St. Bartholomew's Hospital.

Most of the enema apparatus hitherto invented present some disadvantages which militate against their usefulness. The ordinary brass enema apparatus is cumbersome and extremely inconvenient to use alone, as it needs both hands to work it, so that it is difficult to keep the canula *in situ*. Again, if not often used, the packing on the piston is sure to get very dry, and, in hot climates especially, the instrument is in this way often rendered useless, it being no easy matter to pack a piston properly.

The irrigateur of Dr. Eguisier is easy to manipulate, but it is very bulky, very liable to get out of order, and could only be repaired by an instrument maker. Perhaps the best form of apparatus yet made is either the Higginson or Kennedy. They are both of them portable, and can be used with one hand, but they have also both of them one radical defect—namely, the vulcanised india-rubber ball. However good this may be when first manufactured, after a time it undergoes some molecular change and becomes worthless. Again, if the ball be made thin it fills but slowly, and if made thick it is very tiring to the hand; but more than all, oil or turpentine (so often used in enemata) soon destroys the india-rubber.

I have endeavoured to remedy all these various defects in the two forms of enema apparatus I have had made for me by Messrs. Arnold, of West Smithfield, E.C. I propose to call one the Simplex, and the other the Facilis.

The Simplex consists of two cylinders, sliding easily the one within the other. The upper and smaller of the two is closed at the top, and is kept raised by means of a spiral spring which rests against the bottom of the lower cylinder. This latter is closed at its lower end by the solid base on which the instrument stands, and its upper end is made of rather larger diameter than the rest so as to form a circular chamber, which has holes pierced at its under surface. An inlet valve is fitted into the base of the lower cylinder, and an outlet valve to an opening leading to a space between the inner and outer surface of the lower cylinder, which space is continuous with the discharge-pipe.

To use the apparatus, it is placed in a basin or other vessel containing the liquid; the upper cylinder is pressed down by the hand, and then allowed to rise again by the action of the spring. It thus acts as a piston, and the fluid is drawn through the inlet valve into the lower cylinder. On again depressing, the greater part is forced through the outlet valve, and the little that escapes between the cylinders is forced into the circular chamber, whence it runs through the holes on its under surface back into the vessel.

The Facilis is made essentially on the same principle, but it is constructed to feed itself from any vessel, and is intended to be used in cases where it would be inconvenient to stand the apparatus in the fluid: for instance, when it is required to be used in bed, or with delirious or unruly patients. It consists of a cylinder having the upper part of larger diameter than the lower, and fitted with a watertight cover, which is pierced with an opening fitted with a stuffing box. Inside the cylinder is a loosely fitting metallic piston without packing, kept pressed against the cover by means of a spiral spring. In the centre of the upper surface of the piston is a depression corresponding with the opening in the cover. The piston-rod, which is loose, drops into this. An inlet valve is fitted to an opening in the lower part of the cylinder, to which the feed-tube is attached. The upper tube is fitted to an opening on the under surface of the enlarged part of the cylinder, and acts as a waste-pipe. An outlet valve is fitted to the opposite side of the cylinder, and is connected with the discharge-pipe. To use this apparatus, the feed-pipe and waste-pipe are both allowed to dip into the vessel containing the fluid. Then, on alternately depressing the piston and allowing the spring to raise it, the liquid is drawn into the cylinder through the inlet valve, and forced through the outlet valve. What little makes its way beside the loosely-fitting piston goes into the large upper part, and runs through the waste-pipe back into the vessel.

The advantages which I think these apparatus possess are 1. They are very easy to use, needing only one hand to work them. 2. They are eminently portable, the Simplex being only four inches high and an inch and three-quarters in diameter at its widest part. The Facilis is three inches high and two inches in diameter. 3. There is no packing on the piston; and they are so simple in construction that it is next to impossible they should get out of order. 4. They can be taken to pieces to clean, and put together again in a few seconds, and without trouble. 5. They are made entirely of metal, and the springs are of plated steel, so they are not likely either to rust or become weakened.—*Lancet, August* 17, 1872, *p.* 222.

ORGANS OF URINE AND GENERATION.

52.—ON LITHOTOMY.

By Professor HUMPHRY, F.R.S., Surgeon to Addenbrooke's Hospital, Cambridge.

[In lithotomy, as in all other surgical operations, the great secret of success is a painstaking and careful method of procedure. The minimum of deep cutting is the safest course, and gives the best results. It is far better to do the operation very carefully and be a little longer over it, than to do it rapidly and with apparent dash.]

A good case for lithotrity is one in which lithotomy, carefully performed, is attended with very little risk, with quite as little, I believe, as lithotrity. It is less painful, quicker, and more certain; and the greater number of our patients prefer this more expeditious process. I use the common staff with the groove on the convex side in preference to one in which the groove is placed laterally, as recommended by Mr. Liston, because the groove, when on the convex side, is more easily felt in the perineum, and the knife is more easily pressed into it and is less likely to escape from it. A common scalpel is quite as good as any of the variously formed knives which have been employed in this operation; and it is advisable to adhere to a few instruments, just as it is advisable to adhere to a few remedies. By using many of either we merely dilute and waste our experience. The man who uses a few weapons is more likely to wield them skilfully than he who tries, and so perplexes himself with, many. Having made a tolerably free incision through the skin and superficial fascia, I pushed my left forefinger through the tissue of the perineum, down upon the staff a little behind the bulb, so that I could feel the groove of the staff sufficiently to guide the point of the knife upon my finger-nail into the groove. I then cut a little way along the staff, withdrew the knife, examined with my finger, and, again introducing the knife as before, cut a little more, repeating the process till the part of the prostate nearest to the surface was divided, and till I could insert my finger, alongside the staff, through the prostate, into the bladder. Thus the opening was dilated. It was further dilated by my passing the forceps, beside the finger, into the bladder, which I did after having explored the bladder and felt and ascertained the size of the stone. I make a point of doing this, as it greatly facilitates and gives safety to the further steps of the operation, and, having the advantage of a long finger, I am almost always able to examine the size and position of the stone, and select the forceps accordingly. These should be so made as to hold the stone securely and not let it slip from between the blades; and the blades should be broad, so as to cover the stone and prevent its sides catching and rubbing roughly against the tissues as it is drawn through the wound. In the present instance the forceps did not open easily in consequence of the hinge not being quite free. To have used force in opening these might have endangered the wall of the bladder; so I at once withdrew them and resorted to the scoop, which I guided upon the finger again introduced, and with which the stone was quickly removed. An elastic tube, guided upon the finger into the bladder, was secured there, and removed on the third day. The man has not had the slightest pain or discomfort since the operation, and is doing well.

The points on which I lay most stress are, the pressing the finger down upon the staff in the membranous part of the urethra and guiding the scalpel by it into the groove, and careful cutting into the prostatic part of the urethra, and the completing the operation with the finger and the forceps or the scoop. I rarely do more cutting than this. If it is a large stone, I divide the prostate a little more freely with the knife, and then allow the wound to be dilated by stretching or tearing of the tissues as the stone is drawn through it, which I do slowly and steadily, though I have sometimes to use considerable force. By this plan there is no greater division of the tissues than is absolutely necessary, and there is less danger of ill consequences than if the knife is resorted to. I ought to add that it is necessary to be very careful not to allow the finger, still less the knife, to stray into the loose tissue on the exterior of the prostate. Particularly is this care needed in operating upon children. I am sure that many of the disasters which have occurred in the operations upon young subjects have been caused by the finger pushing its way on the exterior of the prostate and bladder, where the tissue easily gives way before it, and where a cavity is easily made by the finger, which the operator mistakes for the bladder. Into this he plunges the forceps, perhaps seizes the bladder or the rectum, or does some fatal mischief. In a little child it is sometimes difficult to enter the bladder. The tissues are soft, and readily give way before the finger; the bladder seems to be at an unexpected distance, and the operator is unnerved by the difficulty. I can give no more valuable hint than that of preparing a young operator for this difficulty, and of warning him to be content to go slowly on, not to be seduced into quitting the guidance of staff, not on any account to withdraw the staff till he is certain that his finger is in the bladder, and till he feels the stone with it, but to work quietly and gradually on with finger and knife till he has brought the finger into contact with the stone. Indeed it is a good rule, from which I hardly ever depart, not to allow the staff to be withdrawn from the bladder till the finger is upon the stone, and not to withdraw the finger till the forceps or scoop is in the bladder. I do not use a very large staff, because it increases the difficulty of passing the finger along it through the prostate. I introduce it with a slight wriggling, rapid, but gentle movement. I am not satisfied unless I hear it strike the stone as well as feel its contact with it. The ear is in this case a better guide than the finger; and if this were more attended to, the cases in which a stone is not found would be fewer. The touch is often deceptive, especially in children, in whom the projecting and slightly roughened rugæ of the bladder frequently communicate, when the sound is passed quickly over then, a sensation to the finger like that given by a stone. I was present not long ago when an operator opened the bladder and could not find a stone. To my inquiry, two or three times repeated, "Did you hear the staff strike upon the stone before commencing the operation?" the reply was, "Oh, we felt the stone quite distinctly; there was no doubt of that!"

Rules in surgery, however, must sometimes be departed from, and judgment and skill may be more shown in the breaking than the observing them. A lad was in the hospital two years ago with severe symptoms of stone, the urine constantly passing. The sound appeared to grate upon something, but we could not hear it strike a foreign body. Several trials gave the same result.

The symptoms were so bad that it seemed best, at any rate, to open the bladder and search for the cause. Accordingly, having introduced the staff as usual, and perceived the grating, I cut carefully upon it and along it quite to its end. I could not discover a stone, and I soon became certain that neither my finger nor the staff was in the bladder. The staff, being no longer of any use, was withdrawn. Then my finger touched the end of a rough stone. Supposing that this had escaped from the bladder into the surrounding tissue, I was endeavouring carefully to extract it when it disappeared; and my finger, following it, passed through what was evidently the prostatic part of the urethra into the bladder, and felt the stone there. It was removed without difficulty. It is, as you see, composed of two oval parts, united at an angle of about 100 degrees. Of these one has a nucleus of lithic acid, and lay in the bladder; the other consists of phosphate of lime, and lay in a cavity or urethral pouch outside the bladder; and the bent neck joining the two occupied the prostatic part of the urethra. The staff, no doubt, had passed into the urethral pouch, beneath the calculus, had probably penetrated the delicate wall of the pouch, and found its way into the cellular tissue behind the bladder, into which I travelled along its groove with scapel and finger. The stone lying in its concavity was not discovered by my finger till the staff was withdrawn. The boy quickly recovered.

You observed last Friday that I quickly relinquished the forceps, and resorted to the scoop. This is an excellent instrument and very safe, because it does not go much beyond the range of the finger. It is not trusted in the bladder without the finger, and is not opened and shut and moved about in the bladder so freely as the forceps are; and, with a little practice, the stone is very easily caught between it and the finger, and drawn through the wound. Even large stones may be thus removed. This stone weighed eight ounces. It is the largest I have ever seen extracted by lithotomy. It is nearly spherical, is rough on the exterior, and was grasped by the bladder so that I could not lay hold of it with the forceps, and should probably have failed to complete the operation had I not fortunately taken with me (it was several miles from Cambridge) this strong well-bent scoop. I contrived to insert it between the bladder and the stone; and it held to the stone so well that with it and my finger I succeeded in gradually drawing the stone through the wound. The patient, a stout farmer, aged sixty-five, recovered without any unfavourable symptom. The handle of the scoop should be large and rough, and the stem round and strong. In some of these scoops I have had the bowl set sideways on the stem, which sometimes facilitates the catching of the stone between it and the finger.

With regard to hemorrhage: I am in the habit of telling my pupils that hemorrhage after an operation is almost always attributable to some fault on the part of the surgeon. It indicates that he has not been sufficiently careful in searching for the bleeding vessels, or that he has not properly secured them. This is, at any rate, a very safe doctrine to inculcate; and it applies to lithotomy as well as to other operations; for the vessels which bleed most briskly and are most likely to give trouble after the patient is placed in bed, are commonly within reach, and may, with care, usually be found and tied. They are the artery of the bulb, or the transverse artery, or some branch divided near the pudic; any of which may be tied. After the removal of the stone I always attend to this point, and sponge out and explore the wound carefully, if there is any bleeding which is likely to give trouble. When the hemorrhage is from a deeper source than I have indicated—that is, from the neighbourhood of the prostate—it cannot always be arrested; but in such cases it usually ceases spontaneously after a short time, there not being commonly any arteries in this situation sufficiently large to keep up, or to cause a return of, the bleeding.

I leave an elastic tube, passed through the wound, in the bladder, in men, to avoid the difficulty which is sometimes experienced by the patient in voiding urine after the operation. I do this because I was, in several instances, summoned after a few hours, in consequence of the patient being in severe pain and unable to pass urine; and I was obliged to introduce my finger into the bladder to afford relief. This trouble, which was perhaps a consequence of the small size of the incision I am in the habit of making into the bladder, is quite prevented by the tube. The tube may be removed in two or three days, or earlier if desirable, and is not again required.

In one instance, a gentleman, aged sixty, in whom the operation was unattended with any particular circumstances, there was rather severe inflammation of the bladder ten days after the operation, with discharge of tenacious and semi-purulent mucus. For several days I introduced, two or three times a day, an elastic catheter by the urethra into the bladder, and injected through it warm water, which, passing out at the wound, washed out the bladder. The symptoms subsided; and he was soon quite well, and has remained so. In another case, when the wound was healing, a patient, a farmer, aged sixty-four, had retention, and required the catheter to be introduced two or three times daily. After a time he quite regained the power. In a third patient, a middle-aged man, in the hospital, the symptoms of bladder irritation set in while the wound was healing, and increased in severity, so that I introduced a sound, and discovering a calculus, I reopened the wound, partly with the knife directed by the staff, and partly with the finger, and removed a rough phosphatic calculus, which I have no doubt had formed in the interval since the first operation, when the stone removed was lithic acid. I mention these cases because it is possible that the symptoms may have been dependent upon the incision in the prostate having been small, and the parts having, in consequence, sustained some injury in the extraction of the stone. I do not know that it was so; and if it was, the occasional occurrence of such events would not induce me to deviate from the practice I am in the habit of pursuing.

With regard to the after-treatment, it is very seldom that any is required. The diet should be, not according to any rule, but regulated by the condition and the desires of the patient. He usually prefers to limit himself to tea, broth, &c., for a day or two; and this generally suits him best. Then appetite returns gradually, and may be yielded to. We do not often find that wine is necessary. The man now under treatment, as I just said, has had no pain or discomfort whatever. Generally some pain is experienced when the urine flows, or at other times; but whether there is much pain or little, whether the patient sleeps or does not sleep, I refrain from giving opium or any other sedative. Pain, even severe and long-continued, though hard to bear, does not seem to do the body much harm. I have often been surprised how little wear and damage it does—not so much, I think, as the sedative which is given for its relief; and the exhaustion of a sleepless, restless night or period is usually followed by sleep, which is more likely to occur naturally at an early period if sedatives have not been used. Under ordinary circumstances a restless night is less damaging than a night of sleep induced by sedative. The patient commonly wakes from the latter paler, weaker, lower, more enervated, and less able to bear pain. I have long had this conviction; indeed, throughout life I have acted upon it. It may be regarded as a prejudice; but I think the patients recover better and quicker, and are less liable to pyæmia, erysipelas, and other unfavourable sequelæ of operations, when thus treated. These, at any rate, we rarely see in Addenbrook's Hospital; and an immunity from them is, I think, partly due to the practice of non-interference after operations so generally followed in this hospital. You will understand that I make a distinction between the use of opium as a remedy for disease and as a means of relieving pain after operations. In the former case it is a very valuable medicine under many circumstances, one of the most valuable we possess. But in the latter case there is no disease; the pain is merely a natural consequence of the physical injury which has been sustained, or of the local changes which are taking place as a consequence of the injury. The condition will generally subside after a short time; and it is much better to allow it to do so, unless there is some special reason for interference.—It is well to suspend the scrotum, especially in elderly persons, so that it does not become moistened with the urine, to keep the parts as dry as possible, and to defend them by the occasional use of oil. I do not remember any instance in my practice in which the wound failed to heal soundly within a few weeks, or in which any unpleasant symptom, except slight difficulty in holding the water, followed; or any case in which the rectum was wounded, or in which any troublesome local symptom remained.—*Lancet, June* 1, 1872, *p.* 747.

53.—ON LITHOTOMY AND LITHOTRITY.

By Dr. J. Cooper Forster, Surgeon, to Guy's Hospital and Lecturer on Surgery.

Do not use an old-fashioned instrument made somewhat after the style of what you know as a "prostatic catheter," but always take a sound with a very short beak. Here is one, for instance, which you will notice resembles very much the lithotrite in its form. With one of this kind you will find that in all children you will strike the stone very easily. In old people there may be some difficulty; but even if there be, it is rendered much less likely to occur with the instrument such as I have shown you. To take a case in point: it is by no means uncommon to have to sound a patient for stone who also has a large prostate; and, if a calculus be present, the chances are that it will be found in the pouch immediately behind that organ. It can then only be struck by turning the beak downward, so that the end may pass into the recess in which the stone lies. What would you do if you had an instrument with a large curve? Turn it downwards you could not, and hit the stone without probably you could not; while, if the unfitness of the instrument for the special case had not crossed your mind, it would probably be withdrawn without finding anything, and you would treat the patient for something else till he had grown tired of his non-improvement and had sought the advice of some abler man. Many a stone has been missed behind the prostate simply because the old instruments could not strike it in that position. This leads me on to another point, which is, that a stone may be struck at one time and not at another. You will have noticed that the child had been sounded six different times at another hospital, and the stone was not felt; and when we come to look at the stone, we see that it must have been in the bladder for a very long time. I take it that a stone of this size (⅞ in. × ⅞ × ½) has been forming much longer than four or five months, the period during which the symptoms have existed. Now it is absurd to suppose that in any hospital the surgeon does not know how to sound a child and detect a stone. It is a proceeding which does not require much art, and any of you would be able to do it easily enough after having passed a catheter a few times. If, then, this boy was sounded so many times and no stone detected, it could only be that for various reasons calculi, even of considerable size, cannot always be felt. The reason that it escaped notice in this instance I believe to be owing to a very closely contracted condition of the bladder, and which caused a little delay in extracting the stone at the time of the operation. This was not because the stone was small, and it was not because my incision was too limited, for having once grasped the stone it came away easily; but it was because the bladder was perfectly contracted, and contained no urine. If a sound is passed into the viscus in this condition, it will have no room to play, and very likely will become entangled in the folds of mucous membrane without once reaching the surface of the stone.

In addition to the stone from which this little boy suffered, I would ask you particularly to notice another feature. He has a prepuce which is adherent to the surface of the glans. This condition is important, because it is capable of producing many most marked symptoms of calculus. Indeed I think I would go so far as to say that in nine-tenths of the children brought to you for incontinence this symptom will be owing to the adhesion between the prepuce and glans. Knowing this, and seeing that the child had such a condition, it perhaps might have been as well to have separated the surface of these parts before proceeding to pass a sound. We should, however, have then had to wait to ascertain if the symptoms subsided. The boy, however, came under my notice as one in whom the presence of stone had been already settled, and therefore it was not necessary to wait; but I shall take care that circumcision is performed before he leaves the hospital to ensure his freedom from trouble hereafter; and I would advise you, whenever a case of suspected stone is brought to you, always to inspect the prepuce first, and if it be adherent, to separate it before you attempt to pass a sound.

In sounding adults whom in all probability you will, should you detect a stone, determine subsequently to lithotrise, you will find it a better plan not to do as I did in this case, for a special reason—viz., pass an ordinary sound first,—but pass a lithotrite at once. It is not more difficult of introduction, and you can detect a stone with it as easily as by a sound. It drops into the bladder almost by its own weight, and you can then, should a small stone be there, if there be no indication to the contrary, crush it at once. I have pursued this plan in private practice, and only the other day a gentleman came to my house with symptoms of calculus, for whom I passed the instrument, caught the stone, and crushed it at once. The stone being broken, he was, therefore, so far on his way to being relieved of his malady. I always, where possible, use the non-fenestrated blades, that the fragments may be more completely crushed, and for convenience I know of no instrument so perfect as Weiss's lithotrite, in which, by merely sliding backwards or forwards a button in the handle, the screw on the inner blade is at pleasure fixed or set perfectly free, to allow of a sliding motion on the outer blade.

I need hardly say much as to the choice of operations. You know as well as I do, that in adults, if the stone be not too large, or the bladder symptoms too intense, crushing should always be undertaken, because it is much less fatal than the cutting operation. In children, on the other hand, lithotomy is so satisfactory that one could hardly improve upon it by any other method.

I have cut a good many cases in children now, and, with the exception of a single painful case in my earlier years, all have been uniformly successful. All men have some accidents in their less skilful days of commencing practice, and I do not believe in that man who never makes any mistake. Let us only be honest, and relate them, that you who are to succeed us may be fully alive to the mishaps which may occur, and which, unless you know that similar ones have occurred before, may, when they come to you, unduly weigh upon and harass you. In one case I tell you that I failed to extract the stone, and the child died, I believe in consequence of the operation.

After lithotrity, according to the number of times you may have crushed the stone at that sitting, there will be of course more or less detritus in the bladder. The passage of this may often be much facilitated by using this instrument invented by Mr. Clover. It is most ingenious, and at times very useful. It consists of a large catheter with a very full-sized eye, or completely open at the end, to which is attached at the upper part a glass chamber, and to this, again, an india-rubber flask. The catheter is introduced into the bladder, and the air having been expelled from the flask by filling it with water, it is attached to the catheter, and the water forced into the bladder by compressing the side of the flask. When allowed to expand again the water is sucked back into the flask, and any fragments that come with it subside to the bottom of the glass chamber. This process can be repeated as often as necessary.—*Lancet, Oct.* 26, 1872, *p.* 592.

54.—INSTRUMENTS FOR TREATING AFFECTIONS OF THE GENITO-URINARY ORGANS NOT COMMONLY KNOWN IN ENGLAND.

By W. F. Teevan, Esq., B.A., Surgeon to the West London and St. Peter's Hospitals.

Without some of the instruments I am about to describe no surgeon can diagnose and successfully treat many of the affections of the genito-urinary organs. Two of the instruments depicted have within the past few years found their way into English practice, and I have no doubt the others will before long become as familiar. I would premise my observations by saying that, except in certain particular cases, the employment of metal instruments is to be deprecated as causing more annoyance to the patient and far greater local irritation than soft ones. The saying of M. Mercier ought always be remembered, "La sonde rigide ne cede pas ; c'est l'obstacle qui cede devant elle." The use of a stiff, unyielding instrument in a passage often tortuous and rugged can only be accounted for by an ignorance of those pathological alterations which take place in stricture of the urethra. It is hardly fair to a patient for a surgeon to commence the practice of catheterism in the most sensitive tract in the body without previously ascertaining by a trial on his own person the comparative merits of soft and metal instruments, and I hope that before long the latter will be rarely seen. There are, however, some surgeons who will not be baffled in the passage of an instrument, and hence these gentlemen will always remain the staunch advocates of an order of things which, happily for humanity, is passing away. Armed with a pointed silver catheter no surgeon need be foiled in attempting to get into the bladder; it is merely a question of force, more or less—no flesh can withstand its bloody onslaught. In one of the museums of London there is a very painful reminiscence of a celebrated surgeon, in the shape of a preparation exhibiting a metal instrument *in situ*, which he had managed to pass into the bladder *without traversing the prostatic urethra.* But I have heard it stated that some patients actually prefer metal instruments. Unfortunately, however, such a statement only shows that in a particular case the surgeon had, through an imperfect diagnosis, used an inappropriate instrument; for if a patient with enlarged prostate and stricture—a common complication—be treated for the latter complaint with an olivary soft bougie he will certainly be subjected to considerable annoyance, for the end of the instrument will impinge against the enlarged lobe of the prostate, and can only be carried over the obstacle by sheer force, whereas a curved metallic bougie will only cause such inconvenience as is inseparable from the material of its construction. The progress of soft French instruments in England has been much retarded by the inferiority of those made here, for most of the catheters soon crack across the eye, and as a rule the olive is much too large, and the neck not being proportionately thick, the bougie gets bent at right angles at its neck, much to the patient's annoyance and the surgeon's fear, for I find there is a wholesome dread of the separation of the olive from its shaft. However with the Parisian instruments such an accident is impossible, and not only are they cheaper, but they are infinitely more durable. I consider a French bougie lives ten times longer than its English representative, which generally ends its short career by breaking its neck. For the introduction of elastic instruments into surgical practice we are indebted to a French goldsmith, named Bernard, who brought them before the French Academy in 1779.

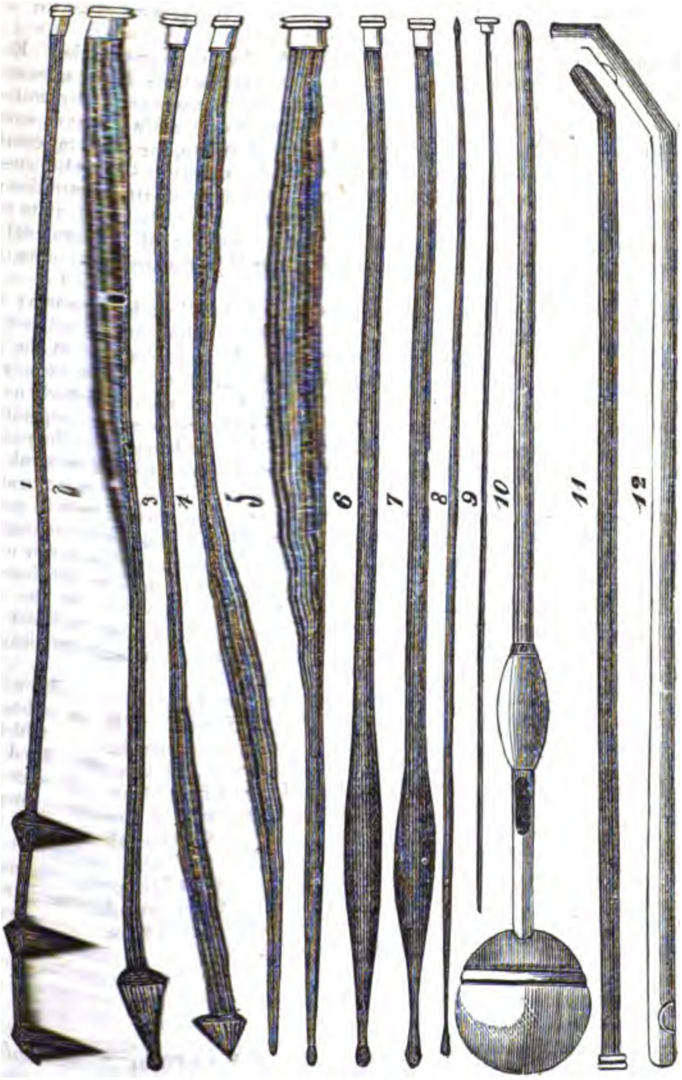
With the exception of Nos. 10 and 12, all the instruments I am about to describe are elastic.

Fig. 1 illustrates the "bougie à trois nœuds." The cone at the end is succeeded by others, each larger than its predecessor. The bougie may be used for dilating strictures or applying ointment to any part of the urethra. It is well known to those who use the bougie à boule that although at first the cone may only be able to get through a stricture, yet, if the instrument be moved to and fro a few times, the obstruction will no longer be felt, owing to the dilatation exercised; and it is the knowledge of this fact which enables us to dilate a stricture considerably at one sitting, if it be thought desirable, by the use of the "bougie à trois nœuds," for each cone being larger than its predecessor, more and more dilates the contracted part. The instrument is peculiarly adapted to ring strictures, and I would say to them only.

Fig. 2 is the "bougie à boule" as altered by Dr. Mallez; and Fig. 3 is Dr. Henry Dick's modified "bougie à boule." The latter was described by me at p. 542 of vol. i. of the *Lancet* for 1870, and I simply introduce it here for comparison. Dr. Mallez claims for his instrument an easier introduction, on account of the tapering olive he has added to the bougie; but inasmuch as the ball-staff is for diagnosis only, I prefer Dr. Henry Dick's, as the greater sharpness of the base of its cone permits an increased perception in diagnosis of pathological alterations. These bougies are made of various sizes, but the most useful are those varying in size from a No. 6 to No. 10, English measurement, which enables us to detect incipient contractions long before they can be ascertained by any other instrument. For a knowledge of the value of these bougies I would refer the reader to an article by me in the *British and Foreign Medico-Chirurgical Review* for July, 1867.

Fig. 4 represents the "bougie conique." At p. 454, vol. v., of the *Dict. de Méd.*, M. Desormeaux in the following words states the value of these conical bougies: "Ces bougies sont, sans contredit, les plus utiles dans le traitement des rétrécissements, dans lesquels elles s'engagent et qu'elles dilatent mieux qu'aucune autre." I find from my own experience that these bougies are most useful in boring through, as it were, tight, narrow strictures, and enabling the case to be completed with the olivary bougies.

Fig. 5 illustrates the "bougie olivaire," already described by me in the *Lancet* at the part referred to. This bougie is applicable to the treatment of the majority of cases of stricture which will admit a No. 4 or 5 English. Its great value is dependent on its olive, which prevents the point from lodging in the lacunæ of the urethra. It is also the only instrument which ought to be placed in a patient's hands; he cannot do any harm with it, the formation of a false passage being an impossibility even if the patient tried. As will be seen by the illustration, this bougie is the conical bougie *plus* the olive placed at its extremity. It was invented by Lioutt at the commencement of the present century, and obtained a prize at the Academy in Paris.



Figs. 6 and 7 represent respectively the "bougie conique à ventre" and "bougie olivaire à ventre." When we have dilated a stricture up to a large size, say No. 12 English, the patient often complains of the unpleasant distension of the meatus externus, which has once more become, as it ought to be, the narrowest part of the entire canal. Now, inasmuch as the shaft of these bougies is much smaller than the other part, we shall, if we use them, only subject the patient to an annoyance lasting for one second, instead of the prolonged inconvenience resulting from having a full-sized ordinary bougie in the passage for several minutes. The instrument dilates the stricture only.

Fig. 8 is a representation of the olivary whalebone bougie. Each end is similar to the other, consequently it will last as long as two bougies not similarly constructed. All bougies might be made double, as it were, by uniting them at the end of the shafts. These bougies can be obtained with ends smaller than a No. ½ silver catheter, and they are of inestimable value, for they combine all the advantages of elastic instruments *plus* the special merit of stiff ones in those particular cases where the perineum is one solid mass of induration; the olive at the end prevents the formation of a false passage, which is quite possible if a tapering-pointed whalebone bougie be used. In cases of traumatic stricture these instruments are invaluable, as they are usually the only ones that can be got through.

Fig. 9 is the elastic filiform bougie, and is the smallest known; its point is necessarily conical, as its extreme tenuity will not admit an olive to be placed on it. Some idea of its size may be gained when I state that a No. ½ silver catheter is equal to about six of these bougies put together. Not only is it most useful for treating all those cases of stricture which are absolutely impassable to any English instrument, but it will also obviate recourse to an operation in cases of retention of urine from very bad strictures, for if the bougie be passed and left in for a few minutes, urine will be found to flow on its withdrawal. The surgeon who has had no experience of this instrument will very naturally suppose that it will double up on meeting with an obstacle; but such will not happen if he takes his fingers off the bougie at every half inch of progress made, for if it cannot proceed further, it will spring back, thus giving the surgeon notice of its arrest. It must be wriggled in, rather than introduced in the ordinary manner.

Fig. 10 is Dr. Mallez's instrument for injecting powders into the urethra, as modified by me. I have made it a breech-loader, and so simplified its action. The instrument is useful for injecting various astringent powders into the anterior part of the urethra in cases of chronic urethritis.

I now come to two instruments which no surgeon ought to be without—M. Auguste Mercier's "sonde coudée" and "sonde bicoudée." The beaked catheter No. 11, resembles a lithotrite so far as its beak is concerned, which is placed at much the same angle to its shaft. This instrument is destined entirely to supplant the English metal prostatic catheter, and also the elastic catheter within a stylet; it never draws blood, and can be used either by the surgeon or patient in cases of retention of urine from enlargement of the third lobe of the prostate. But cases of difficulty often arise either from the extreme obesity of the patient or from the great extension of the floor of the prostatic urethra, and no ordinary prostatic instrument can be passed; for such cases M. Mercier's "sonde bicoudée" (Fig. 12) is invaluable. I believe it is practically unknown in this country—*Lancet, Aug.* 24, 1872, *p.* 255.

55.—A NEW METHOD OF TREATING HYDROCELE.

By S. MESSENGER BRADLEY, Esq., Manchester.

While the various plans of treating hydrocele hitherto recorded possess the prestige of a high antiquity, they all alike suffer from being occasionally unsuccessful, or even hurtful, in their results. These objections hold good, though in a less degree, in speaking of the treatment by tapping and injecting the vaginal sac, which has practically superseded all other modes. This operation, first recommended by Celsus, who advised nitre as the best injection, fell into a long desuetude after his death, until revived by Monro the elder, and of late years popularised by Sir Ranald Martin, whose claim to originality lies in his choice of iodine as the most suitable stimulating agent. Other plans are, however, resorted to from time to time, either from their greater safety and simplicity, or from the occasional failure of the iodine treatment. Thus, briefly to summarise these methods, we have—1, *treatment by acupuncture*, recommended by Lewis, and still sometimes adopted and found to succeed in cases of congenital hydrocele; 2, the mere *application of an evaporating lotion*, such as muriate of ammonia, vinegar and water, which, it is probable, has only been found of service by Keate, who, I believe, was the first to recommend it to the profession; 3, *simple tapping*, nearly always failing to effect a cure, and not always without danger, inasmuch as it is sometimes followed by a hæmatocele, or even sloughing of the scrotum; 4, *laying open the sac*, a plan approved by the fathers of medicine, but abandoned by their descendants of the present day; 5, *excision of a portion of the tunica vaginalis*, which has, in having been practised by Albucasis, an almost equal antiquity with the one last mentioned, and has met with quite an equal neglect; 6, the plan of *evacuating the fluid and introducing some caustic on the end of a probe*, of which Paulus Ægineta writes in warm praise, and which, though occasionally adopted, as Humphry states, at the present day, is not likely, either from its success or safety, to become more general than it deserves; 7, *the introduction of a tent into an open wound*, as performed and praised by Paré, Baron Larrey, and others; and 8, the somewhat similar plan, still, I believe, commonly practised by the Arabians, who were the first to adopt it, of *passing a seton through the vaginal sac, and there retaining it for twenty-four hours*. It is likely enough that this operation would succeed in cases which resist all milder treatment, but, from the by no means trifling danger attending it, it should not be resorted to if we can equally achieve our object by a safer mode of procedure; and this, I believe, can be done, as I will endeavour to show.

It very frequently happens that a hydrocele must be treated, if treated at all, in the out-patient department of a hospital or at the surgeon's residence; that is to say, at a distance from the patient's own home. Now the disadvantages arising from this fact are, that the walk home after operation is apt to induce considerable and even dangerous inflammation, or that a hæmatocele ensues as the result, not necessarily of wounding the testicle, but of a dribbling from the scrotal veins, which are turgid from their dependent position.

Pondering these circumstances, and also reflecting upon the fact that the walls of pyogenic membranes, such as those of abscesses, sinuses, and the like, will often agglutinate when brought into firm and continued apposition; and remembering, at the same time, that the serous tunic of the testicle is from its physiological nature liable to take on adhesive action, and that, from the character of the secretion poured out in a hydrocele being inflammatory and not dropsical, it would even be prone to do so, I was led to the inference that simple tapping, followed by firm and equal strapping of the affected side, would probably be followed by an obliteration of the vaginal sac and a consequent radical cure.

It was not long before I was enabled to test the accuracy of this reasoning. A medical man applied to me with a large simple hydrocele, which had been tapped several times, and the last time injected with iodine without success. After explaining my object to him, I tapped the hydrocele, drawing off half a pint of fluid, and tightly strapped the affected testicle with soap-plaster. This was done at my own house, and the patient walked home, a distance of about a mile, immediately afterwards, and continued to go about during the process of recovery, which probably took place in about ten days; I say probably, as I kept up the pressure for three weeks without allowing the testicle at any time to remain unsupported. This case occurred eight months ago; since then I have followed the same course in three other instances, and in each with an equally satisfactory result. In no case was there any fresh effusion of fluid. Another case which came under my notice was of some interest in illustrating the advantages of strapping in what would beforehand appear quite unfavourable circumstances. A man came to consult me about a recent hydrocele of some magnitude; I tapped and emptied the tumour, but did not strap it at the time, as there was a strong force of pediculi encamped in the pubic and scrotal hair; ten days afterwards he visited me again, having got rid of his unwelcome guests, but with his tunica vaginalis as much distended as ever. I again tapped him; but, though I do not think I wounded the testicle, which could be plainly enough seen at the back of the tumour, I did not succeed in drawing off any fluid worth speaking of; nothing followed, indeed, but a few drops of bloody serum. In three days he came again with his scrotum larger than ever. The tumour had now, however, changed its character; it was now no longer transparent and pear-shaped, but opaque and rounded; it had also become very heavy and much more painful than it had ever been before. In other words, a hæmatocele had formed. Without the anticipation of much good resulting, I resolved to try the effect of strapping in this case; suffice it to say that this proved effectual, not only in causing the absorption and dispersion of the vascular extravasation, but also in permanently curing the hydrocele. In spite, however, of the success in this instance, I am not inclined to think that the plan would prove generally efficacious in the treatment of even recent hæmatocele, and I do not now at all desire to advocate it in such cases.

In regard, however, to hydrocele, it appears to me that we have in this plan of tapping and strapping one which satisfactorily fulfils the idea of curing safely, quickly, and pleasantly, and which, though perhaps not about to prove infallible, is one which should be certainly tried in all cases (especially, I would add, those treated away from the patient's home), before the injection of iodine or other stimulant is resorted to. If cases occur in which neither the mode I here advocate nor the iodine treatment is successful, I am of opinion that a combination of the two would be likely to prove so.—*British Medical Journal, June* 1, 1872, *p.* 580.

56.—VARICOCELE.

[The following is from a report of operations at St. Thomas's Hospital.]

Mr. Sydney Jones operated in a well marked case of this disease, as usual, on the left side. The testis was atrophied, and the patient suffered from much aching pain. Mr. Jones proceeded in the same way as he adopts for ordinary varicose veins of the legs, and which he has invariably found to succeed. The vas deferens being held out of harm's way, two harelip-pins were passed behind the veins, and thick silk used so as to compress the opposed sides of the veins, but not so tightly as to cause ulceration; a tenotomy-knife was then introduced so as to divide subcutaneously the veins between the two pins. The patient was then transferred to bed, and an ice-bag applied. Mr. Jones stated that the pins were allowed to remain from seven to fourteen days; the time varying according to the amount of irritation produced.—*Medical Times and Gazette, Sept.* 21, 1872, *p.* 326.

AFFECTIONS OF THE EYE AND EAR.

57.—THE TREATMENT OF CASES OF STRUMOUS OPHTHALMIA.

By Dr. Henry Power, Senior Ophthalmic Surgeon to St. Bartholomew's Hospital.

[Belladonna taken internally exerts a remarkable influence over the progress of strumous ophthalmia, in certain cases when other plans have failed. After describing the well-known general aspect of a case of strumous ophthalmia, the writer continues:]

The group of symptoms that are then presented are that, with the general aspect above described, the child exhibits intense intolerance of light; it holds the head down, covers the eye with the hands, and resists strenuously their removal; the least attempt to open the eyes causes pain, copious flow of tears, and not unfrequently sneezing, when a large quantity of muco-purulent fluid escapes from the nostrils; the lids are often almost natural, or but slightly red and swollen. To obtain a view of the cornea is no easy matter even to a practised hand, in consequence of the spasmodic action of the corrugator supercilii and orbicularis palpebrarum; and if it cannot be accomplished by placing the child with its back to the light and coaxing, nothing remains but to take a seat opposite the nurse, receive the head of the child between the knees, and raise the lid with a speculum. This proceeding, though perfectly harmless, is often regarded by the friends as a piece of refined cruelty, and it is perhaps better to administer chloroform, which has itself and alone sometimes appeared to me to produce a marked change for the better. It is advisable to make one thorough examination in the first instance, as occasionally ulcers of considerable depth may be found, which, unless properly treated, may perforate and leave an unsightly scar and great impairment of vision. Yet, in the majority of cases, the appearances of disease presented when the eye is fully exposed are wonderfully slight. A little redness of the conjunctiva, a small ulcer or two near the margin or on the surface of the cornea, sometimes with a leash of vessels running up to it, a superficial abrasion of the corneal epithelium, and that is all. The cornea is elsewhere clear, the conjunctiva and sclerotic almost of their natural colour, the iris apparently healthy, with a much contracted pupil.

The cause of the intense photophobia, so out of proportion to the local inflammation, has occasioned much speculation. It is probably to be attributed to an exaltation of the sensibility of the optic nerve, resulting from irritation of the terminal branches of the corneal nerves. These branches we now know, from the researches of Klein, pass up between the cells forming the corneal epithelium, nearly, if not quite, to the surface, where it is probable they end by forming a plexus. When the epithelium is abraded, or, owing to defective nutrition, is not properly regenerated, the nerves must be exposed, and every motion of the lid must irritate them. Such irritation is believed to act reflectorially on the optic nerve-centres, producing photophobia, and also on the branches of the fifth, supplying the lachrymal gland, causing the profuse lachrymation.

The first stage in the development of one of the little herpetic ulcers, as they are often called, appears to be, as Iwanoff has shown, a minute collection of nuclei, or nucleate cells between the epithelium and the anterior layer of the cornea. These appear to be a proliferation of the corpuscles of the sheath of the nerves, or at least to travel along the nerves between the sheath of Schwann and the nerve substance, and thus form a pale vesicular-like swelling, which soon bursts, and leaves a small ulcer with yellow base, if on the conjunctiva, or with a whitish surface, and surrounded with an area or halo of grey, troubled or cloudy aspect, if on the cornea. In this state it may last for many days, neither materially increasing nor exhibiting any tendency to heal. In some bad cases, however, especially if the child's bowels and general health have been much neglected, it rapidly extends, and, perforating the cornea, leads to prolapse of the iris, after which the whole affection quiets down.

Wherever a disease is of a constitutional nature, and requires general treatment, directed by an intelligent appreciation of its etiology and of all the circumstances leading to its persistence, the remedies employed must necessarily be various, because each case requires to be treated upon its own merits, and the sound practitioner finds that he must vary his treatment in accordance with its exigencies; and also because there have always been those who, mistaking the *post hoc* for the *propter hoc*, have attributed to the action of some drug or agent acting locally, which has really been due to other circumstances acting generally. Hence alike the origin of and the disappointment occasioned by specifics. It appears to me that in the treatment of this disease, attention should always in the first instance be directed to the state of the bowels. It is advisable to see the motions, for valuable indications of treatment may be derived from them. As a rule a brisk purgative is very useful at the outset, and I generally prescribe five or ten grains of the compound jalap and scammony powder, with one or two grains of calomel, which, if the scammony be of good quality, acts well. An emetic repeated for two or three mornings, as suggested by Mackenzie, sometimes acts capitally. Ten or twenty grains of ipecacuanha may be given with half a grain or a grain of potassio-tartrate of antimony, according to age and strength. When the bowels are quite natural, some form of tonic is required, and our choice usually lies between the preparations of iron, quinine, and cod-liver oil. The former may be given in rather large doses, as from ten to fifteen minims, the quinine in one or two grain doses, and the oil in one to four drachm doses, three times a day. The latter remedy acts best in children of fair complexion. Great advantage will be found in adding two or three grains of hydrargyrum c. cretâ to the quinine. For some years I always commenced the treatment by giving this combination to children suffering from strumous ophthalmia, using no applications to the eye except atropine, and was well satisfied with the results.

General treatment, however, is by no means sufficient to cure the patient, and amongst the many local remedies I have tried, I should give the palm to atropine, in a two or four grain solution, Pagenstecher's yellow ointment, and calomel. With one or other of these most cases may be cured.

Cases, however, occasionally occur in which all these plans of treatment fail,; and the question comes, what must now be tried? It is then that I claim attention to the value of extract of belladonna, given internally. I have repeatedly found that it rapidly diminishes the intolerance of light, and by its power of relieving the spasm of the muscles closing the lid, enables the child to obtain an amount of benefit from air and exercise that was previously impossible. I can entertain no doubt that its good effects are attributable to its action as a stimulant upon the sympathetic system of nerves, and through this upon the smaller vessels. It is further of use in doing away with the necessity of purgatives, as even in small quantities it acts efficiently in clearing the bowels. I have usually prescribed it in doses of one-eighth to one-quarter of a grain. It is perhaps scarcely necessary to add that, as it is a potent remedy, its effects must be watched, and its administration should be suspended as soon as the child complains of thirst, or when the rapidity of the pulse is observed to be increasing. I have only noticed these symptoms in one or two instances. I have also found the extract of belladonna serviceable in cases where the affection was rather a limited keratitis than phlyctenular ophthalmia; that is, in which a small segment of the cornea was hazy and vascular near the margin, even though the intolerance of light may not have been very intense. I consider the seton, though recommended by so good an authority as Mr. Bader, a *pis aller;* and find the treatment mentioned by Dr. Swanzy, as practised by Von Gräfe, though it was originally suggested by Jüngken, of dipping the whole head for a few seconds in cold water, not persistent in its effects.

The following is a *résumé* of one of the cases that has recently been under my care, showing the benefit that may be derived from the use of the extract of belladonna in obstinate phlyctenular ophthalmia:—

M. C., æt. four, was brought to me in the beginning of January of the present year. She had had measles (not an unusually severe attack) in August 1871; this was followed by stoppage in the nostrils and herpetic eruption on the lip and on the right ear. At the end of August her mother took her to Yarmouth for a month. She was ailing all the time she stayed there, complaining of thirst, with restlessness at night, languor, and loss of appetite. These symptoms continued up to November, when the right eye became affected. She was taken to an ophthalmic hospital, when some tonic medicine was ordered for her, and a poultice was directed to be applied. A crop of pustules appeared over the brow, temple, and cheek, and the left eye became affected. I then saw her, and found that she was suffering from a well-marked attack of phlyctenular ophthalmia. On examining the eyes several pustules were visible on the conjunctiva at the margin of each cornea, whilst superficial abrasions or ulcers were apparent on the corneæ themselves, the right being much the more severely affected, so that a large part of its surface was cloudy. She was ordered a purge, and a powder containing three grains of hydrargyrum c. cretâ with one of quinine, thrice daily. A four-grain solution of atropine was dropped in, and a lotion of extract of belladonna given to take home, and to be used frequently. But little improvement resulted, though the mercury and quinine were continued for a fortnight. The bowels being somewhat disordered, and the lips and ala nasi having some pustules upon them, it was thought likely that there were worms. Another purge of compound jalap powder and a turpentine injection were therefore ordered. No worms, however, were observed in the motions; cod-liver oil was now prescribed, and after a short time a little steel wine was added to it. The use of the belladonna lotion was continued. This plan was persevered in for a month with little benefit; the child sometimes opening the eyes in the evening and playing about, but always coming to me in the morning with intense photophobia. The mother was exceedingly intelligent, and assured me that the bowels were regular, the motions natural, and that the food given to the child was carefully selected, wholesome in quality, and though its appetite was variable, yet upon the whole the quantity was sufficient for its needs. Calomel powder was now applied directly to the cornea for several days, but ineffectually, so far as the relief of the photophobia was concerned.

Finding that the symptoms were stationary, I now determined to tap both eyes with a broad needle, and allow the aqueous humour to escape. The benefit was considerable, the child opening the eyes on the following days for some hours, and I thought recovery would take place without further trouble. However, a relapse soon took place, and she was now placed upon one-sixth of a grain of good extract of belladonna three times a day. In two days the mother brought her to me obviously greatly improved. The intolerance of light had greatly diminished, and she even saw to pick up a pin on the carpet. She continued the use of the extract for a fortnight, when it was given up, and some quinine mixture ordered. A few days later she went into the country. This child has lately been seen by me, looking fresh and rosy, with only slight nebulæ on the corneæ of both eyes, but able to bear strong light perfectly; and I can feel no hesitation in attributing the improvement here observed to the internal use of the belladonna, it was so immediate and proved so persistent. —*Practitioner*, *October*, 1872, *p*. 203.

58.—ON THE MODERN ART OF TINTING OPACITIES OF THE CORNEA.

By Dr. Charles Bell Taylor, Nottingham.

Extensive leucomata and dense opacities of the cornea have long been considered among the opprobria of surgery; we could not remove them, they were always a source of embarrassment to the surgeon, and, especially in the case of women and young persons, a serious trouble to the patient, so much so that I am convinced that patients suffering from this cosmetic defect and applying for relief cared more for the removal of the deformity than for the restoration of the partially intercepted sight. Such being the case, we hail with gratitude, as a most important addition to modern ophthalmic surgery, M. Wecker's reintroduction and perfection of an ancient method of tinting away these unsightly defects.

The operation, which, as a rule, causes very little pain or irritation, is best performed with a number of the finest needles firmly bound with the points on a level around a handle such as a penholder, or a large needle which has been grooved for the purpose by Messrs Weiss may be substituted with advantage in certain cases. The substance which M. Wecker recommends for tinting is Indian ink; but I have also employed sepia, ultramarine, and other colours with advantage, and when an immediate and deeply coloured effect has been desirable, a combination of lamp-black with Indian ink, and a solution of nitrate of silver. The patient may either recline or be seated in a chair, and it is well to separate the lids with a speculum, and steady the globe with a pair of ordinary forceps, taking a firm grasp of the conjunctiva. The needles are then dipped in one or other of the solutions in question, which should be made as thick as possible, and the superficial layers of the cicatrix are rapidly punctured in an oblique direction, and layers of the solution applied just as in ordinary tatooing, until the white speck is changed from a most apparent deformity into a black surface scarcely visible; a fresh layer of the substance is then applied over the tatooed cicatrix, the patient is directed to keep his eyes open, so as to let it dry on and remain as long as possible, and he may at once go about his usual avocations.

It is important not to close the eye, and to prevent, as far as possible, the washing away of the pigment by the tears; this is best accomplished by enveloping the operator's fingers with a silk handkerchief, so as to mop up the secretion, and afterwards by the avoidance of winking on the part of the patient. M. Wecker is content with ten or fifteen punctures a time, and requires from his patients four or five sittings. I have, however, usually completed the operation at once, and made any little addition that might appear necessary some weeks later; the slightest specks, such as are left after phlyctenular conjunctivitis and small ulcers of the cornea, are easily banished by one or two pricks of the needle: and when the whole eye has been opaque, very unsightly, and sight completely abolished, I have very advantageously substituted extirpation of the globe, or the superimposition of an artificial eye, by tatooing a round central pupil so as to restore to a remarkable and most charming degree the natural appearance of the globe. Not only is deformity removed by this slight operation, but patients generally tell us their sight is improved, a fact due, no doubt, to the circumstance that a black speck is much less dazzling than a white one.

In cases of large cicatrices, I generally make an artificial pupil first, and tint the opacity afterwards; and when this is carefully done, it is difficult to distinguish the black speck from the neighbouring artificial pupil. I have no doubt that this little operation will also be found of service in cases where considerable dazzling follows the removal of a portion of iris, either *per se*, or when the operation has constituted a part of the operation of extraction for cataract; as by tatooing the cornea an invisible opacity may be occasioned which will constitute a permanent shade, and shut out the light to any required extent; soft cicatrices are readily coloured, but old, hard, and incrusted ones are more difficult of treatment. In these cases, the nitrate of silver and lampblack are of service; no doubt, also, lead, sulphur, charcoal, gunpowder, and other ingredients will come to be employed in time. In some cases, the coloration is not very permanent, but it may always be repeated; and even if the perfect blackness do not remain, a greyish semitransparent coloration takes its place, which looks very like cornea, and it is infinitely preferable to the original deformity.

It is well to commence the tatoo at the lowest surface to be operated on, in order that the operator's sight may not be obscured by an overflow of the liquid. I shall conclude by quoting a case in which this addition to our armamentarium enabled me to render a real service to a young lady who was suffering not only from loss of sight, but also from a most embarrassing deformity.—*British Medical Journal, Sept.* 7, 1872, *p.* 271.

59.—A NEW METHOD OF DESTROYING FAULTY CILIA IN CASES OF LIMITED TRICHIASIS OR DISTRICHIASIS.

By Patrick J. Hayes, Esq., Surgeon to the Mater Misericordiæ Hospital, Dublin.

[For the information of those of our readers who are not well up in all the hard words coined by ophthalmologists we give Mr. Wharton Jones's definition of districhiasis. It is "merely a variety of trichiasis, in which the misdirected eyelashes are disposed, though not very regularly, in a row distinct from the other which remain properly directed." Mr. Hayes relates two cases in each of which the affection had been of long duration, and operative measures employed which had produced in both instances a certain degree of permanent corneal opacity, with impaired visual power.]

Case 1.—This patient was a young countryman, of strong, though rather strumous aspect. For several years his eyelids and eyes had been weak and liable to frequent attacks of inflammation. On examination I found he had opacities of the right cornea, resulting from old ulcerations; also a slight amount of symblepharon and blepharo-phymosis; but the latter conditions did not produce any real inconvenience. The left eye was somewhat irritated in consequence of the backward direction of cilia growing near the outer part of the upper eyelid, for though the patient had pulled out several large hairs, yet some fine and short ones often escaped the grasp of his forceps.

I informed the man that by a slight operation I believed the irritating eyelashes might be removed, but that nothing could be done to improve the condition of the right eye. This opinion afforded him some consolation, and he at once consented to the treatment proposed. I desired that in the meantime he should not remove any of the growing hairs, as they would guide me in adopting measures for their extirpation. Deeming the case a suitable one for the operation proposed by Herzenstein, I passed a subcutaneous ligature from the palpebral margin, so as to enclose the roots of the offending cilia; but the result was, to a certain extent, incomplete, partly because, in spite of my directions, some lashes had been extracted, and, therefore, the position of their follicles could not be ascertained when the ligature was being passed, but also an irregular line of very small hairs existed so close to the posterior or conjunctival edge of the free margin of the lid as to render their obliteration by Herzenstein's method quite impossible. I now determined to employ subcutaneous injection of tincture of the perchloride of iron, which I knew from experience might be so used as to destroy the vitality of a very limited amount of tissue. I performed the operation in the following manner:—A Desmarres' entropion forceps was applied to the eyelid, and so compressed as to cause arrest of circulation through the included portion. Next, a fine hypodermic syringe, charged with a few drops of the tincture of perchloride of iron, was passed obliquely through the palpebral margin, pushed to a point just above the roots of the abnormal cilia, and the tincture slowly injected, as it were, against the follicles. This proceeding was repeated in such a way that the two oblique punctures included the group of cilia to be destroyed. After a few minutes the forceps was loosened, the lashes carefully pulled out, and the eye bathed with cold water. The patient suffered no inconvenience from the operation until the third day, when inflammatory swelling of the lid appeared. This was treated with bread and water poultices, until ulceration of the palpebral margin permitted the escape of a narrow slough of subcutaneous tissue, with complete removal of the hair follicles. The patient soon left hospital, expressing great satisfaction, and stating he never had expected to feel his eye so strong and free from all irritation.

Case 2.—My second patient was a young woman who had been previously under the care of a distinguished surgeon in one of the principal hospitals in this city. According to her statement she suffered for a considerable time from trichiasis affecting the lids of both eyes, which produced chronic conjunctival inflammation and superficial corneal opacities. About eighteen months before her admission to the Mater Misericordiæ Hospital she consulted the surgeon already alluded to, who most skilfully performed Arlts's operation; but although the patient consequently derived great ease and benefit, yet a few cilia, forming a limited districhiasis, continued to cause considerable annoyance to the right eye. As the other patient was at the time in hospital, and afforded most satisfactory evidence in favor of the injection treatment, I adopted a similar method in this case, and with like permanent relief.

The chief points demanding attention for the safe injection of tincture of the perchloride of iron are:—Firstly, That the eyelid should be firmly compressed between the blades of a suitable entropian forceps. Secondly, That the fine tubular needle of the hypodermic syringe should be passed, and applied, as closely as possible, to the deep ends of the hair follicles. And lastly, That only a very small quantity of the tincture should be introduced.

If those rules be adhered to the operation affords a simple, comparatively painless, and effective means for producing the required extent of madarosis.—*Dublin Journal of Medical Science, March*, 1872, *p*. 190.

60.—ON THE PRESERVATION OR DESTRUCTION OF THE CONJUNCTIVA IN CASES OF EXTIRPATION OF THE GLOBE.

By J. F. Streatfeild, Esq.

When surgeons, not so very many years ago, used, ignorantly, very rarely to remove an eyeball, and never, probably, unless the case was supposed to be one of cancer, whether invading or not the surrounding orbital tissues, they took a long sharp-pointed knife, curved on the flat, and with a circular cut, including the eye, they removed it and a large portion of the neighboring soft parts: the conjunctiva, in the general confusion, was, for the most part, and irregularly, also excised. But when it was found, by the injurious effects of sympathetic irritation and inflammation, that very many lost eyes (certainly all that are blind, in the ophthalmic sense, and painful) should be removed, and also that seldom comparatively any more than just the eyeball itself need be removed, and that when, and though, it must be removed, as little as possible need be done, a mode of operating for this purpose was re-introduced, sometimes now, therefore, called "enucleation": the conjunctiva was henceforth all and entirely to be carefully preserved, not only for the sake of its preservation, and that only as much as need should be done in the operation, but to give a regular space, as large as possible, and sufficient room for the wearing of an artificial eye of good size. A considerable cavity, called the "conjunctival sac," is left thus after the operation, now usually done as I have said. In the centre, at the bottom of this space, is to be felt a nodule with a cruciform indentation, where the four rectus tendons are lying involved in the central dense cicatricial tissue, and are seen to move it about in some degree when the other eye is moved. And this hard mass is to support the artificial eye, and by the muscles of the excised eye it is to get all the movement that can be now obtained for an artificial eye. And this is the best we can do; for "abscission" is an operation that must be avoided, and will be certainly soon altogether given up. All this I believe to be indisputably true, and the best line of practice of which we have at present any certain intimation in a general way. It holds good in our private practice in nearly all cases, because the patients will almost invariably desire, as they can well afford the expense and the trouble involved in, the wearing of an artificial eye. But in cases of some few of these well-to-do patients of a different mind, and in very many of those of our hospital patients, this trouble and expense, if well understood beforehand by the patients themselves, will not be entertained, or, if it is entertained, it is in the future found to be impracticable. Some patients, again, are met with, whether in private or in hospital practice, who either before or since the excision operation are quite incapable, and cannot by any surgical method be made capable, of wearing an artificial eye, even if they desire it; such are the cases of irregular cicatrisation within the lids, caused by wounds or burns, or caustics, or ill-surgery, and producing obstinate entropion, strong cicatricial bands in any direction (that cannot be isolated by a probe passed beneath them), or a narrowing of the whole conjunctival sac or of the palpebral aperture by any of the above causes. Once again, though the palpebral aperture be not narrowed nor the conjunctival sac contracted, there may be an obstinate ectropion, probably of the lower lid, which cannot be so well remedied by any surgical method as securely to retain an artificial eye.

I beg to propose now, instead of the unvarying rule of the preservation in all cases of the whole or as much as possible of the conjunctiva whenever the operation of extirpation of the globe is or has been done, its total destruction in the following cases.

1st. When the patient entertains an objection to the having to wear a glass eye, either before the excision operation or at any subsequent time, because of the trouble it occasions, the recurring expense, the annoyance of conjunctival discharges, &c.; and therefore he, after a full explanation, gives up the idea of wearing an artificial eye for the future.

2nd. When the wearing of an artificial eye is impracticable, and cannot be made practicable by the arts of surgery, by even any one firm band whose anterior end is at or near the edge of either eyelid. A full explanation, again, of the nature of the case to the patient is here also necessary; or at some time hereafter, though the mind of the operator is free of any blame, yet, if he adopt the operation I now propose, the patient may falsely say *he* made it impossible that an artificial eye should be worn.

3rd. When the bands are many or large, or the contraction of the conjunctival sac is such, or the lids so considerably though incompletely bound together, or so everted, that neither the surgeon nor patient can have any hope of an artificial eye being worn.

At present the surgeon in view of such a case thinks he has no more he can do, and, indeed, he thinks the same in cases I have classed under the first and second heads. He dismisses the cases of all three classes from his mind as of those with which he has no longer any active practical concern. But I believe he may yet relieve the patient of much annoyance and of some of the deformity, by finally curing all discharges by altogether permanently closing the eyelids. At present the patients of the three classes above are condemned for the future to go about with a small patch tied over the empty orbit, obliquely over the forehead and round the head. We constantly meet with them in the streets, and, if they are begging, they expose the hideous gap, bleared and running with matter by lodgment of foreign bodies in the sac, by the effect of changes of temperature, &c., on the sensitive mucous membrane, and, above all, by the irritation probably of the row or rows of eye-lashes fallen in upon and brushing the mucous membrane, unsupported by an artificial eye. It is an improvement *in appearance*, as well as a comfort to the patient; in any case, if an artificial eye is not or cannot be worn, whether the palpebral aperture and conjunctival sac be full-sized or almost closed by cicatricial contraction. It is a disgrace to surgery not to close up the ugly chasm, and it is easily done.

I remember some time ago a man at University College Hospital for whom it was necessary that I should recommend a lost eye to be removed; hesitating and procrastinating, as patients in such cases, and not suffering much pain, will naturally do, finally consenting, and stipulating that the eyelids should be closed up over the wound, for he would not be troubled to wear an artificial eye. At this hospital there is a fund out of which any after-surgical appliance necessary for the good result of any operation can, on the certificate of the surgeon, be supplied. At the Moorfields Ophthalmic Hospital it is an old regulation that every patient for whom an eye has been removed, be supplied by the hospital authorities with a first artificial eye, and this regulation is well known to the patients and is constantly quoted by us in our endeavours to overcome the natural objections of patients to the removal of a lost eye; so that at this hospital our patients the sooner determine to have the necessary operation done, and accept as a matter of course, the gift of the hospital. They think little of the saving of money that will be required of them to replace the artificial eye, which is, perhaps, soon broken, or is, in a year and a half or two years, worn out, as a remote event, and numbers of them come back to us sooner or later in one or the other case, lamenting their inability to procure for themselves the missing artificial organ. Then the money required at once is not forthcoming, and, in the absence of any competition in London in the making of the eyes to be worn, the expense is the more considerable. They wear the inevitable ugly patch in the empty orbit, or a handkerchief is tied over it, and, if they cannot afford an artificial eye, and it cannot be afforded for them, how much better off they would be with their two eyelids finally and totally closed together. I have lately at Moorfields had a patient who had an eye either carelessly excised or previously injured in such a manner as to have ultimately necessitated its excision, and a hard, firm, broad band of cicatrisation as a consequence extended back from a part of the margin of the lower lid into the deeper parts of the orbit. It was impossible to remedy this state of things and to enable the patient to wear a glass eye. He was much disappointed in this, but, as it could not be, he assented to my proposal that the eyelids should be entirely closed up. Under anæsthetic influence I incised the conjunctiva and dissected off great part of it, beginning at the bottom of the irregular contracted sulcus between the lids. The bleeding of course was excessive, and not all of the conjunctiva was removed. When healing of the wound thus caused had taken place, of course the lids were almost closed, but little deep pits and irregular spaces between the lids remained here and there, where some conjunctiva had been left. I then finally destroyed all this remaining conjunctiva by use of the actual cautery, the iron, red hot, thrust to the bottom of the deep hollows, and drawn horizontally along the parts between the lids yet lined with conjunctiva, so as to draw them closely together in the next process of cicatrisation. It was perfectly successful, and the patient can have no more unpleasant conjunctival discharges from useless mucous membrane, and his deformity is much ameliorated, as much as it is possible.

But it is so difficult to dissect off the delicate conjunctiva from the irregular surface and deep-seated space in which it lies, when the eye has been removed at a previous operation, and the bleeding meanwhile is so great as to obscure very much the operation, that I would suggest it to be destroyed by smearing over the conjunctiva, carefully preventing its transgressing the margins of the lids, a thin paste of chloride of zinc, to be left there long enough to destroy the conjunctiva, and then to be all thoroughly washed away, and the opposite surfaces allowed to heal. If any small spaces are then left between the lids of remaining conjunctiva they should be got rid of and closed up by use of a hot iron, and left to unite.

It will be so difficult to strip off or dissect away the whole conjunctival surface, leaving the subconjunctival tissues, at the first operation, when an excision is done, that it will probably be found most convenient to excise the eye, as it has been done of late years, preserving the conjunctiva and allowing the deep wound to heal; when, if the patient proved to be indifferent to the appearance of having a second eye, or unwilling or unable to submit to the expense or the trouble of the substitute, at a second sitting the conjunctiva may be then, with the assent of the patient, by a secondary operation totally destroyed by producing a slough of all the mucous surface, and consequently a final closing of the eyelids.

Besides these cases, it is, I believe, a surgical duty in all cases of incurable contracted cicatrices within the lids, or of thickened everted lids, that, when the eye has been removed, the useless conjunctiva be not left to produce offensive discharges, and to disfigure the patient more than he need be disfigured, and that a similar operation with chloride-of-zinc paste supplemented with the hot iron be adopted, or that some other means to the same end be employed.—*Lancet*, *June* 15, 1872, *p.* 821.

61.—WHEN AND WHERE TO IRIDECTOMISE IN CASES OF ANTERIOR SYNECHIÆ REQUIRING AN ARTIFICIAL PUPIL OPERATION.

By J. F. Streatfeild, Esq.

In the practical suggestions I have put forth on this subject I have omitted to make a note of exception which had long ago been placed in the memoranda of my note-book, concerning the detachment of anterior synechiæ in iridectomy. If the iridectomy be done at an early period, when the inflammation has subsided and the adhesions in front are quite recent, the iridectomy may be done as well or better at any part of the circumference of the cornea (downwards and inwards?) that may seem to be best, without any regard to the corneal iris adhesions, which will freely separate themselves, and cannot re-form subsequently. In an ordinary long-deferred iridectomy, where there are anterior synechiæ, and the iris is to be removed at a part where these exist, it is torn through its substance, and the part external to the tear is drawn out and excised. It probably bleeds very much, and the more central portion of the iris at the part chosen for the excision is left. Then there are greater probabilities of continuous bleeding from the iris or of a fresh inflammation of it. When, in these cases of adhesions of the iris in front, the operation is done early, and, if necessary, at the part where the adhesions are, the concave pupillary margin reappears in proper form, when and where the traction of the iris forceps is applied, and the iridectomy can extend up to this inner circumference, and an entire segment be removed and some at least of the hateful iris-adhesions are abolished.

But in the proper class of cases for these early iridectomies at any part of the circle—a class which is neither the commonest nor very uncommon.—I would not be misunderstood to mean that all cases in which anterior synechiæ form may be taken in this class and be thus successfully treated by operation. There are some few in which, though operated on early, the iris will only tear from the cornea; and the position of these adhesions in these cases cannot be disregarded, but must be considered beforehand, as they have been by operators in the old way of deferred iridectomies for anterior synechiæ; indeed, when the cases can be diagnosed before the operation is begun, they may be deferred as all have been hitherto.

Where leucoma and anterior synechiæ follow penetrating wounds or perforating ulcers of the cornea not quite in the centre, and the aqueous humour being let out, the iris of course falls forward, and not only by apposition then with the back of the cornea becomes glued there, but, being opposite the external opening, it prolapses and becomes impacted or strangulated, as in old iriddesis operations, the iris will then only tear, and cannot detach itself in an iridectomy, which may therefore be deferred. Sometimes these cases are certainly to be diagnosed by the appearance in the white leucoma of a small dark-brown patch of uvea there fixed. The iris cannot then be separated as a whole. If we were to suppose a window-curtain to be in part accidentally glued to the shutters, separation might be effected without tearing by drawing the curtain aside; but if also shut in between the closed shutters, the tearing of the curtain must inevitably attend the act of separation. The simile is not perfect, or we must suppose the curtain affixed to the shutter would separate as a perfect whole only before the glue was dry.—*Lancet, July* 13, 1872, *p.* 38.

62.—ON THE ADVANTAGES OF USING TWO SHARP HOOKS WHEN IT IS NECESSARY TO EMPLOY TRACTION IN CATARACT OPERATIONS.

By J. F. Streatfeild, Esq.

There seems to me to be an increasing number of examples of the surgical instances in which it is found that two similar instruments are better in use than one. If an operator had many hands, instead of only two, it would be, no doubt, of great advantage to him. Some monkeys seem to have, practically, four (or five); but if we want to employ more than two hands we must engage an assistant for a third (or third and fourth) hand, and to him is entrusted the least important parts of the work to be done. Much more may be accomplished by determination and practice with our two hands than is usually done; and an assistant is, at best, a necessary evil in an operation, if he is indispensable. It does not at all interfere with the small movements required of our fingers in an eye-operation if the various little instruments are placed one in each of the inter-spaces of the first phalanges of the fingers of the left (or right) hand; three at least can be so held, besides the forceps to steady the eye, which is committed to the thumb and forefinger of the same hand; the knife in the right (or left) hand. When each instrument has been used it is laid down, and we have not to wait an instant for the next that is wanted, or to arrange to hold it differently from the way in which it was given into our hand by the assistant. For my part, I frequently, in order to be independent, hold in my right (or left) hand, as well as in the other, more than one instrument, of those that are not sharp or cutting, between the palm of the hand and the ring and little fingers of the same. These remarks and suggestions would, I presume, hardly ever apply in general surgery, with larger instruments and more considerable movements of the hands and fingers in the operations. In eye-operations it is almost always best to be behind the head of the patient, lying on a high couch, with his feet in a well-lit window; and in operating, as in an ophthalmoscopic examination, it is best to stand, for then our movements are more freely made, not only from side to side, but by raising or lowering the head, so that the eye of the patient may be viewed in all directions and in various lights, as may be necessary, and this without approaching to or receding from the subject of the operation. Most eye surgeons prefer to sit down when operating or in an ophthalmoscopic examination; and for this purpose, in operating theatres and ophthalmoscopic rooms, at the hospitals at least, music-stools are provided: in operations, by way of getting, in some degree, the use of a third hand, I generally screw up this stool to a convenient height, and put my left (or right) foot on it, and, the patient's head being covered with a towel, I rest it against my knee to steady it; the wrist of the hand with which I am operating being also engaged in the operation on the other side, to aid in preventing any little unexpected movements of the head of the patient. I do not know that I could make any greater use of my own abilities in order to acquire a complete independence. Two fingers of the left (or right) hand are all-sufficient to hold open, and keep apart, the lids, and at the same time to steady the eye in any operation in which no considerable opening is to be made in it, as in cataract-solution operations, when one needle only, in the right (or left) hand is to be used. But if an incision is to be made in the coats of the eye, the pressure required to be made upon them by the two fingers, which are placed actually on the eye, on the ocular conjunctiva and the margin of each of the two separated lids, would be too much for safety, and then a spring speculum and fixing forceps must be submitted to. If the middle and ring fingers are thus used, their soft ends are put between the lids and upon their margins and then separated, and with them the globe of the eye is pressed sufficiently backwards to secure its not moving, the forefinger and thumb of that hand being still available. When an eye is fixed thus with two fingers, it is much more securely fixed than by means of any ordinary fixing forceps, which holds the eye at one point only of the mucous membrane, and, as this coat is loosely attached and easily torn, the instrument will only ineffectually prevent some of the movements effected by the rectus muscles, much less will it restrain the rotary movements of the obliqui. Impressed with this defect of our fixing forceps, wishing to have the eye to be operated on more completely under my command, and considering that only *two* fixing forceps could effect my purpose, I, some years ago (*Ophthalmic Hospital Reports*, iv., 100), had forceps made which control *all* the movements of the eye completely; each blade is bifurcated with a U-shaped extremity, the width apart of the two ends of either blade being equal to one and a half or two diameters of an ordinary cornea, so that with it the eye is secured at *two* opposite and far apart points, by holding with it the conjunctiva and subconjunctival tissues at the customary most convenient distance from the margin of the cornea. These double ends (for the two blades of any forceps only supplement one another) are equivalent to *two* similar instruments. But the forceps must be carefully regulated in use, that the two ends be neither dragged upon nor depressed unequally; but, as we have no more than two hands, it is useful that the forceps may only employ one of them. The double hook used in general surgery in excising tumours is preferred to two hooks in separate handles for the same reason and for other reasons, one of them being that there is less chance of the double hook tearing out, as the force of the traction is halved, or unequally divided (as it is in the case of my double-ended forceps). When two separate and duplicate instruments can be used together, one in each hand, it is often very advantageous; it is no longer a question of economy of hand power, but traction is halved, or any other specific action of the two instruments is divided between them, and the action of either of them can be, and should be, always made supplementary to, and regulatory of, the action of the other, its opponent or coadjutor. With one hand one instrument "plays into the hand" of the other. When the best of all instruments only are used, "two are better than one." In the final stage of enucleation *two* fingers are better than forceps, with which to move, or fix, and guide, and retain the eye-ball—better even than more than two fingers, which are unnecessary, and probably in the way. *Two* hands are similarly useful in removing very large tumours.

Two opposite iridectomies are often advantageous when one is insufficient; so that, in these later times, two are sometimes made at once, opposite each other, in the same eye, at the same time of operating: sometimes even the corneal openings are made simultaneously with *two* broad needles, one in each hand, to avoid the escape of the aqueous humour by the first-made opening, when they are made separately, with an interval, however brief it may be, of delay. I am not now concerned in the consideration of the advantages of double iridectomies or other double or single (*e. g.*, squint) operations, but only in the advantages of using two similar instruments (in one or two handles) in some cases in which the objects of the operation, and how it is to be done, have been long ago determined.

There is a little-used, old-fashioned instrument in cataract instrument cases which has held its place in all the vicissitudes to which extraction operations have been subject of late years; for it is supposed to be sometimes indispensable, although as it is generally employed (too late to be of use) it might as well be absent. I mean the "sharp hook." *It is really a useful instrument; but we ought always to have not one but two of them for use together, and begin to employ them soon enough in the* (*unpromising*) *operation cases in which the sharp hook or some other traction instrument has been hitherto made use of as a last resource.* When I say *soon enough*, I am embarrassed by the conviction that I cannot quite define when the need for the instrument (instruments) has arisen. In mere operating practice is very much, and we learn to appreciate symptoms without bringing our minds even to the effort to describe them. Still, I think I can make this clear: when the need for a sharp hook (or of two sharp hooks) has arisen, the two sharp hooks are infinitely better, not only than one, but also than any spoon or scoop, or any other of the traction instruments, which are still used in these cases of emergency by all the best operators, although the practice of "out-scooping" cataracts has been long abjured by them.

The common sharp hook is as fine as may be to have sufficient strength and stiffness, though not much of either is required: it tapers, very gradually, from its proximal end in the handle to the very sharp point in the end hook. This hook is about one-twentieth of an inch and somewhat C-shaped; but the hook does not form more than one-third of a circle altogether. It was never much used, but its occasional use has never been abandoned. It was called for when the lens, in extraction of cataract, receded into the vitreous chamber instead of coming forward in the regular way. In flap-extraction this recession, when it occurred, was as rapid—often instantaneous—as was the advance of the lens in a successful course. If it descended it was lost to view; and yet the operator, armed with the sharp hook, would seek for it, and then he abandoned the attempt, and there the lens was left and the eye closed. When a suicide has thrown himself into the water we do not "drag" the river with but one hook. The operator may sometimes have succeeded in hooking the lens, more probably the retina, but of course he would not so be able to hold it. As I do not now operate by the flap-extraction, I need not determine exactly what I should do in it, but if I could not see the lens I think I would not seek for it, and if I could see it I would not attempt to hold and extract it with one hook only.

To proceed to von Graefe's extraction and my own experience. In the various stages of this operation, and under anæsthetic influence, there is no such need for hurry nor any such cause for sudden alarm: all is much more leisurely and safe. The lens advances slowly and gradually, gets a little more than half outside the corneal opening (and then it cannot recede); or it does *not* advance but a very little way, or not so far at least as to be half outside the corneal opening, and then, soon, pressure being still kept up, it will recede, and the vitreous advance. If the lens does not advance (and the corneal opening does not require enlargement) or begins to recede, or advances a little and then begins to recede, I take two of the sharp hooks, one in each hand, and, inserting one and then the other in the corneal opening, with the convexity of the hook downwards, pass them, held in the same way, both some distance directly back into the vitreous chamber and behind the lens till both are considerably past the middle of its back surface; then a slight rotation in the right direction (the necessary amount—a quarter—to be observed and calculated before the hooks are introduced, for their ends cannot now be seen) of the two instruments, one in either hand, brings them towards the lens. Their hooked extremities, being brought somewhat forward and then in a direction as if to withdraw them from the eye, are securely caught in the lens at its lower third or below the centre. From the moment when the lens is first caught in this way by one or other of the hooks, as at the same time a movement to withdraw them, and the lens of course with them, is made, the lens will rotate a little and incline to the right or left, and then we begin to appreciate the advantage of having two hooks, each one to aid the other: the lens, meeting with some slight resistance to its being withdrawn and moved from the eye, would inevitably fall off on one side or the other of the single hook, and the result would be worse than *nil*, for not only would the lens be lost, but it would be more or less comminuted, and so become more difficult of removal. Of course the two hooks may get a good anchorage in the body of the lens at the same instant, and this regulatory movement with the second hook may not be required. We have, in the next place, only slowly and very observantly, to withdraw the two hooks equally together, and the lens on them; withdrawing a little more, comparatively, the one or the other of the hooks accordingly as one observes the lens to make a slight beginning of a rotation towards that hook, so as to stop that rotation and make the lens advance straightforwardly to its complete extraction. The patient, meanwhile, is kept profoundly under the influence of the anæsthetic, and if the eye is inclined to roll upwards, it is held down by fixing-forceps committed to the hands of an assistant.

Thus much concerning what I have called the "regulatory" action of the second (either) sharp hook. As to the "supplementary" action of the same I would explain it by a reference to a case in which I failed for want of it—*i. e.*, a second hook. It was some years ago, but I remember it very well because of the extraordinary length of the case. It was at the University College Hospital, and I had not a second sharp hook, because one is now generally, and was then universally, supposed to be all-sufficient. At this hospital we have all necessary instruments, all that can be required—a complete set; but at Moorfield's, where I first used a *second* sharp hook, I could have it without ordering it, because, with so large an ophthalmic staff, and so many instruments, constantly under repair, there are duplicates of all kinds. In the case of University College Hospital, all had gone well at the beginning of the operation; the cataract was mature, there were no unfavourable symptoms, the globe was not soft, it was an ordinary senile cataract, commencing to form also in the other eye, and there were no posterior synechiæ, &c. But the lens, I do not know why, would not come forward but a very little, and soon began to go back, until the lower half of it was hidden behind the lower part of the iris. Some vitreous humour escaped, and the lens seemed inclined to descend lower and out of sight. I took the sharp hook, put it behind the lens in the vitreous chamber, and secured it and brought it forwards and upwards at last; then I essayed to bring it out, but it rotated and swayed from side to side, comminuting the back surface of the lens and detaching fragments which must be left behind. In order to make sure of not losing the lens altogether I had to keep the single sharp hook very firmly pressed into the lens, and, just as I thought I could extract it as a whole, it broke into two, and I brought out one half which was in front of the hook. (This would not have been so, I believe, if the pressure and traction had not been necessarily so great, and all at *one* place.) The other sank low down in the pupil, and another gush of the vitreous humour occurred. I was now afraid to attempt the removal of the second half of the lens, for it had become so much involved in the vitreous humour, and I did not think I could hold it with the (one only) instrument of whose powers, in my hands, I had just been making trial. So I was glad to close and bandage the eyelids. The extraordinary end of the case is, that the man gained at last, and has at the present time, a perfect eye as regards vision. The half of the cataract, and the fragments also remaining in the eye, involved in the vitreous humour, rose towards the corneal opening and left a considerable space below them, and above the iris, of free pupil. In this situation they were found when I examined the eye next after the operation (the corneal opening was then already united and healed) and so they have remained ever since, only somewhat shrunken in the course of time. I think I could have removed the lens whole if I had had two sharp hooks to divide the pressure and dragging force between them, to prevent the sideways rotation and swaying to and fro of the lens, and the comminution and final split into two. All this a second sharp hook would have done for me, had I known it then and provided myself with a second hook. So would a spoon or scoop, some will say; but I will not omit to speak of the *comparative* advantages of the two hooks.

The two fine hooks occupy no appreciable amount of space in the corneal opening; they do not comminute the lens as one hook does, they transfix and hold the lens (it does not merely lie on them as a lens lies in the spoon or scoop which is used by most operators on these occasions), so that it can be brought out straightforwardly without need (or fear) of compressing it against the back of the cornea *and some of the iris, perhaps between them.* It is as different in practice as it is to land a fish with a gaff rather than to secure him only in a landing-net; the sense of safety and power is so very unlike in the two cases; it is a triumph even *before* the complete extraction of the lens which had threatened to escape, and a feeling very unlike that afforded by the partial security of a single hook or the danger of a scoop retaining the lens. Some soft cortical lens matter is almost certain to be left to be removed after the main body, nucleus, &c., of the lens is extracted; but this is commonly the case in all Graefe's extraction-cases, and the main body being out of the way, this soft lens matter may be extruded with a curette, as in other cases of extraction (or, at least, it should be attempted) in which there has been no mishap, or any fear of one. The rotatory tendency in a lateral direction, of which I have said so much in order to its prevention by using the two sharp hooks instead of one only, and by drawing one or the other of them a little more or less during the extraction—this very rotation which I have tried to avoid by all means, may be utilised in the final stage of the extraction when the lens is almost loose from the eye, by watching the opportunity of any inclination that it may have to rotation, and then turning it out so, sideways.

The advantages I have found in the use of the two sharp hooks I have described, in the cases in which, with a sufficiently large corneal opening, the lens will not advance, or having advanced a little way will not proceed through the opening, but seems rather inclined or has begun to recede, and the vitreous humour instead of it inclined to advance, are,—that an extraordinary amount of power is obtained, so that the lens cannot but be extracted; that it may be so well guided by a little more traction on one or other of the hooks; that by them it can be drawn straight out through the external opening without any harmful dependence and pressure upon parts opposite the traction instruments—the cornea and iris, against which the lens is often thrust violently in extracting by means of a spoon or scoop.

In a case recently at Moorfields, in which I operated for cataract in my usual way, von Graefe's method with my modifications—for every one now adopting this method of extraction has some particular fancies in which he allows himself to depart from the exact rules of the master,—all had gone well, and the corneal section was of fair size, but the lens after a little advance stopped, and beside it at one angle of the wound a prominent bead-like protuberance of the vitreous humour showed itself. I of course remitted all pressure with the curette; the vitreous protuberance remained. With the two hooks I drew the lens straight out through the opening in the way I have described; the vitreous humour retired altogether, and none of it was lost. This is almost the only case I know in which by any method when some vitreous humour has protruded so decidedly in an extraction-operation, the lens has been then after wards extracted without loss of any portion of the vitreous humour. But if, as in most of my cases in which in alarm I have used the two hooks, some small portion of the vitreous humour is lost, and the lens has been extracted before or afterwards, it is very much better and more certainly done, I believe with the two very fine little sharp hooks than with a single larger instrument, and probably much more disturbance and compression of the neighbouring parts, besides the other disadvantages of a larger instrument and of one only. —*Lancet, July* 13, 1872, *p.* 38.

63.—A FEW PRACTICAL REMARKS ON THE TREATMENT OF CATARACT.

By George Critchett, Esq., Senior Surgeon to the Royal London Ophthalmic Hospital, Moorfields.

Before we proceed to the consideration of the advantages of the curvilinear, as contracted with the flap extraction, it may be interesting and useful to describe the method of performing the modern operation or the Graefe extraction, as it is sometimes called. As it is a painful and tedious process, far more so than by the flap wound, it very much facilitates its performance to place the patient under the influence of chloroform. The lids must be fixed open by means of a wire speculum. I prefer the one modified by Professor Noyes, of New York; it has the advantages—1st, That it can be regulated with exactness by means of a screw which is on the nasal side, and is thus out of the way of the operator; 2nd, It does not press upon the globe.

The eye being sufficiently exposed it is fixed by means of a pair of forceps with broad serrated extremities that will take a firm hold of the conjunctiva, and of the sub-conjunctival tissue. Von Graefe's needle knife is made to enter the anterior chamber, puncturing the corneo-sclerotic tissue at a point corresponding to the first dot of the dotted lines in Figs. 1 and 2, it is then passed across the upper part of the anterior chamber, and made to emerge at a point corresponding to the last dot of the curvilinear dotted line in Figs. 1 and 2. If it is wished to perform the true Graefean operation, and to make the entire incision in the opaque fibrous tissue, the line indicated in Fig. 1 must be followed; if the cornea is to be involved in the wound then the line indicated in Fig. 2 is to be followed; when the section is made in the white fibrous corneo-sclerotic tissue a loose fold of conjunctiva has generally to be divided. After the curvilinear section is completed, the next step of the operation is to remove a portion of the iris; this may be done to a moderate extent so as to leave a loop-shaped pupil, or it may be cut away as far as the extreme angles of the wound, thereby leaving a much larger and broader pupil—the former is the plan adopted by the Berlin professor and followed by myself, and gives the best optical results; the latter may, perhaps, give greater safety to the operation and avoids the possibility of entanglement of iris in the edges of the wound. The next step in the operation is to open the capsule as freely as possible; this is a matter of some difficulty because the cataract in its capsule is

Fig. 1.

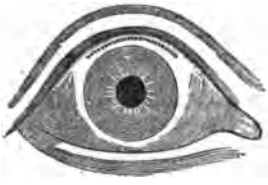
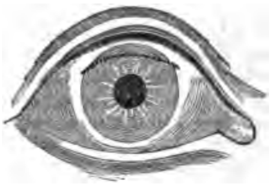


Fig. 2.



at this period in contact with the inner surface of the cornea, so that in passing the curette into the anterior chamber it is liable to penetrate the capsule at the edge, and close to the wound, and thus leave the anterior surface of the capsule entire and unlacerated. This, as we shall find hereafter, has an important bearing upon the question of secondary or capsular cataract and explains in a measure the greater frequency of this sequel after curvilinear extraction, than after the more ancient method by the corneal flap.

The next and third stage of the operation is the expulsion of the cataract. This may be accomplished very much in the same way as in the old flap operation. Usually it will pass through the curvilinear section very readily, but if it offer some slight resistance, it may be in consequence of the edge of the cataract impinging against the edge of the section instead of between the lips of the wound; if this occur the spoon of the curette must be gently pressed upon the posterior or upper lip of the section so as to press it behind the edge of the cataract when it is endeavouring to escape, and when it is in some measure entrapped by the sharp border of sclerotic wound, the edge of the cataract being thus brought between the edges of the curvilinear section it will usually emerge very readily under the influence of gentle pressure applied to the lower border of the cornea. If the cataract escape complete and entire the operation is finished; if, however, fragments of the peripheral portion remain behind, it is desirable to remove them if possible by means of gentle pressure; it is more especially important to remove any fragments that lie in or near the wound, as by getting between the edges they may seriously impede union. In spite of every effort it not unfrequently happens that some soft matter remains behind, and when the aqueous humour réforms, an opaque layer will be visible in the area of the pupil; if it be imprisoned between the layers of the capsules, it will remain as a secondary cataract, and will require a subsequent needle operation; if not, it will undergo absorption under the solvent action of the aqueous humour. If the fragments do not escape spontaneously it is better not to endeavour to remove them by the introduction of a spoon into the chamber; you thereby bruise and irritate the edges of the wound, you risk a rupture of the hyaloid membrane, and an escape of vitreous humour; and you often fail in getting away the fragments. It is important before closing the lids finally, to see that the edges of the wound are in accurate apposition, that there is no soft cataractous matter, and no blood clot interposing; a soft compress either moist or dry must then be fixed over the lids with a bandage.

It will now be interesting to compare the advantages and disadvantages of the curvilinear with the flap extraction. In stating the case for curvilinear extraction as compared with the flap operation I may mention in limine the safety with which chloroform may be employed; this has the double advantage of robbing the operation of all its terrrors for the patient, and of enabling the operator to execute the various stages deliberately, and with precision, and without any spasmodic action of the muscles either of the eye or eyelid; in many cases this is a valuable adjunct and much increases the prospects of success. In the second place, the requisite skill for the performance of this operation can be more readily acquired and the execution of the various stages be accomplished with greater certainty and exactitude than in the flap operation. In the third place, the wound has an inherent tendency to keep in exact apposition, and in this respect contrasts most favourably with the flap, since the muscular contractions and spasmodic movement, which must necessarily separate this latter serve to keep the curvilinear section more completely in contact and closed. In the fourth place, and as a further result of the form of wound, the vitality of the cornea is not endangered, and union by the first intention rendered more certain. In the fifth place, prolapse of the iris which was so frequent and so serious a complication of the old operation is rendered impossible. In the sixth place, recovery is more rapid and more sure, and the patient may be safely permitted such an amount of liberty as removes all tedium and penance during the after treatment; a matter of some importance during the restlessness that often accompanies advanced age and an ill-disciplined will. We have thus, as it seems to me, stated six cogent reasons why the curvilinear section is preferable to the flap operation. We will now consider in what respects it is inferior to that operation.

In the first place it leaves the eye in a less perfect condition both optically and cosmetically than a perfect flap extraction with its small round central pupil. In the Graefian operation the pupil is large, loop-shaped, and eccentric, and the curve of the cornea somewhat changed, so as to produce some irregular astigmatism. Although practically this does not entail any important inconvenience to the patient, yet it is a more mutilated and a less perfect organ in the one case than the other, and is more open to censure and criticism on the part of those who may be disposed to find fault. In the second place, it is more likely to be followed by a secondary or a capsular opacity requiring the performance of a second or needed operation, respecting which I may have more to say hereafter. In the third and last place there is a liability in a certain small average of cases to the occurrence of secondary iritis of a very tedious intractable nature, which produces serious impairment, and even extinction of sight. This may come on in a week, a fortnight, and even three weeks after the operation; it may close the pupil, and bulge towards the cornea, or it may extend to the choroid, and produce softening of the globe, atrophy, and blindness. If this condition once sets in the prognosis is unfavourable. The cause of this secondary traumatic iritis is most probably the bruising and stretching of the angles of the wound, and the injury done to the ciliary nerves during the exit of the cataract. This would seem to be proved by the fact that an ordinary iridectomy is never attended with such unfortunate results, and that the flap extraction enjoys an equal immunity from such sequelæ. Moreover, I have met with more than one case in which the other eye seriously suffered from sympathetic ophthalmia, though I hope and believe this is a very rare complication.

The liability to traumatic iritis after this form of contraction is the most serious indictment that can be brought against the operation and one that has been observed by all who have practised it extensively; it is, however, of comparatively rare occurrence, and will probably become still more rare, as we learn to regulate the incision so as to permit the escape of the cataract without any force or stretching of the wound. In spite, therefore, of these three drawbacks—viz., the mutilation of the eye, the liability to secondary cataract, and the occurrence of iritis, it offers such numerous and important advantages over the old flap extraction, that it has established itself amongst a large majority of ophthalmic surgeons, and is destined to occupy the first rank as a method of removing cataract. This was amongst the last scientific bequests from our revered *confrère* Von Graefe, and it must go far to establish its position to know that, with his immense experience and judgment, he considered the operation as established and to be preferred before all others. Whatever the verdict of posterity may be, after prolonged experience as to its universal applicability, it must, I think, be retained as a most valuable contribution to ophthalmic surgery, as peculiarly applicable to those cases in which flap extraction is clearly contra-indicated, and as relieving both the operator and the patient from much needless anxiety. Highly, however, as I value this method of operating, and frequently as I have recourse to it, yet I cannot be unmindful of its weak points, and of the one serious source of failure; viz., the occurrence of traumatis iritis; and in any case in which this occurred in one eye, it admits of serious question whether some other method should be adopted when the second eye is operated upon. Following up the same train of thought as that which ultimately led to the curvilinear extraction, we may ask ourselves whether there is any plan whereby the objections to the flap extraction on the one hand and to the peripheral curvilinear extraction on the other, can be escaped—the main objections to the former being, as you remember, a liability to prolapse of iris, and non-union of the flap; the main objection to the latter being a tendency to iritis. When in Brussels last autumn I saw an operation performed at the clinique of my excellent friend and *confrère*, Mons. Warlomont, which seems in a great measure to meet this desideratum. It consists in moving the curvilinear section lower down, so as to be entirely corneal.

In performing this operation Graefe's needle knife is employed; it is made to traverse the anterior chamber just above its centre, and to cut its way out by turning the edge gradually forward, so that the curve of the section being of the same shape as in the operation of Von Graefe, shall form a line rather above the edge of the pupil. After the capsule is opened the cataract, however hard and fully formed, will readily escape, leaving a small round normal pupil. Since my return from the Continent I have performed this operation several times both at the hospital and in private practice, and I find it possesses many advantages. In cases where it is undesirable to administer chloroform it is a very painless operation; it is compartively easy of performance, it inflicts the least possible injury on the eye; the curvilinear form of the wound renders prolapse almost impossible, and favours union of the cornea, the pupil retains its circular form and central position, and its optical conditions are good; that form of traumatic iritis that sometimes occurs in the corneo-sclerotic section is altogether avoided, so that the more serious dangers both of the flap extraction and of Graefe's method are escaped. The chief risks are the liability of the iris to fall forward and attach itself to the curvilinear and central section, and the tendency to suppuration which all corneal wounds exhibit in certain conditions of the constitution. The eye is more irritable and painful, and makes a slower recovery than in the more favourable cases of corneo-sclerotic section, in which the restoration is often remarkably quick. An extended experience is needed before we pronounce a final verdict upon the merits of this curvilinear corneal section, but it certainly possesses some important advantages, and may be adopted just in those cases in which the operation of Graefe may be contra-indicated, as, for instance, where chloroform is inadmissible, or strongly objected to, or where an eye has failed through traumatic iritis, or choroido-iritis. When the subject comes to be calmly considered in all its details, and by the light of an extended experience, it will probably be thought to be unscientific and inexpedient to adopt any one method to the exclusion of all others. The controversy must in all probability chiefly turn upon the question whether the cornea or the white fibrous tissue connecting cornea and sclerotic is the most prone to heal, and can be most eligibly selected for the section. Each of these tissues is liable to dangers from which the other is exempt, so that if we can learn to select the particular form of operation suitable to a certain state of constitution, we shall increase the probabilities of success, or where one method has failed, if we choose the other for the companion eye, we in this way give our patient a better chance, or if we operate on both eyes at the same time we shall use a wise discretion in selecting one method for one eye and the other for its companion. I believe the curvilinear form of section ought in future to supersede the flap, as being more scientific and more prone to heal, but if we would reach the highest average of success we must vary the situation of the curvilinear section in accordance with the peculiarities in the reparative and healing powers of our patient. For those who are prone to suppurative inflammation the fibrous tissue should be selected for making the section; for those who show a tendency to plastic exudations thet corneal wound is indicated. I think this recent method may be denominated "extraction by median corneo-curvilinear section." It was originally suggested and performed by Lebrun, of Brabant.—*Medical Press and Circular, April* 3, 1872, *p.* 291.

64.—TWO CASES OF AMAUROSIS TREATED BY THE SUBCUTANEOUS INJECTION OF STRYCHNIA.

Under the care of Charles Higgins, Esq., at the Central London Ophthalmic Hospital.

Case 1.—Joseph W., a single man, a watchmaker, has been in the navy, and seen a great deal of foreign service, especially in India. Twenty years ago he had a sore on his penis, but no symptoms of syphilis. Has left the navy ten years. His health has generally been good. He has been in the habit of smoking a large quantity of tobacco, and has drunk a great deal of spirits. For two months he has noticed his vision becoming impaired in the same degree in both eyes, accompanied by a feeling of fulness in the eyeballs, but no pain.

February 10th. Can make out letters of No. 8 of Snellen's types at about five inches with either eye. On examination with the ophthalmoscope, in the left eye the outer half of the optic disc is pink and white in patches, the inner half uniformly pink; the retinal bloodvessels, especially the arteries, are thin and few in number. The right eye is the same as the left, with the exception that the retinal vessels appear larger and more numerous. In both eyes the vessels appear displaced towards the inner side of the optic disc. Ordered pulv. opii gr. ⅛ in pilula ter die.

24th. No improvement. One-fortieth of a grain of strychnia injected beneath the skin of the temple.

28th. One-thirty-second of a grain of strychnia injected.

March 3rd. One-thirty-second of a grain of strychnia injected. Reads Snellen 6½ at six inches with both eyes.

30th. Strychnia has been injected twice a week, the quantity having been gradually increased to one-eleventh of a grain. Reads Snellen 3½ at about six inches.

April 13th. Injection has not been repeated for a fortnight. Reads Snellen 3½ at about eight inches with both eyes, and says he can do his work as well as ever he could. Examination with the ophthalmoscope shows little change. The outer half of each disc is of an uniform pinkish-white colour, not patchy as before; the inner halves are still uniformly pink. The retinal bloodvessels present no change.

Case 2.—Charles K., the father of three healthy children, was formerly in the army, is now a cabinet-maker. Thirty years ago he had a sore on the penis, accompanied by suppurating bubo, but no symptoms of syphilis. Six months ago he had a severe blow on the head from a piece of timber. About the same time he had a severe attack of rheumatic fever. Five months ago he noticed his sight failing; both eyes became affected together, and loss of vision has continued to progress in both equally. His health is usually good. He is a great smoker, and has drank a great deal of spirits.

February 24th. Right eye reads Snellen 12; left eye reads Snellen 15. With both at six inches he cannot distinguish colours. On examination with the ophthalmoscope both optic discs appear white and anæmic; the retinal vessels, especially the arteries, are thin and few in number, the change being more marked in the left eye. One-fortieth of a grain of strychnia injected beneath skin of temple.

27th. One-thirty-second of a grain injected.

March 2nd. Right eye reads Snellen 2½ at eight inches. Left eye reads Snellen 6½ with difficulty with a biconvex lens of fourteen-inch focus. Right eye reads Snellen 1½; left eye not improved by any lens. Can distinguish colours.

20th. The injection has been repeated twice a week, the quantity of strychnia having been increased up to one-eleventh of a grain. He still reads the same letters.

April 10th. Has not attended for three weeks. Vision remains the same as on February 27; the left eye has never improved as much as the right. Examination with the ophthalmoscope shows little or no difference, excepting that I fancy the retinal vessels are rather larger.

Remarks.—I look upon both these cases as examples of tobacco amaurosis. Both certainly improved much under the treatment. Whether the good result was brought about by the use of the strychnia or by abstinence from smoking and drinking I am not prepared to say. I may add, however, that I so frightened both these patients at their first visit by telling them what probably would happen if they continued these habits, that I have reason to believe they ceased to smoke and drink to a very considerable extent. In the first case the strychnia seems to have done all the good, as the patient had been under treatment by opium for a fortnight before its injection.—*Medical Times and Gazette, July* 20, 1872, *p.* 68.

65.—PRACTICAL OBSERVATIONS IN OPHTHALMIC AND AURAL SURGERY.

By Ernest Hart, Esq., late Ophthalmic and Aural Surgeon to St. Mary's Hospital.

It will be useful to group together, for the sake of emphasis, a numerous class of cases in which I have seen mischief arise from slowness to employ atropia locally. Looking through a long list of cases, I find that I have employed atropia-drops in the course of the treatment of 1,523 out of 2,710 consecutive cases of disease and injury of the eye (a list not including, of course, affections of the ophthalmic appendages); and I pass in review a long array of cases in which I had to regret that it had not been used before the patients came into my hands. Two of the most recent consultations which I have entered, were cases of injury to the eye, respectively at Paddockhurst and at Brighton, during the last month. In both cases, the treatment had been unexceptionable, except that atropia had not been used; and, though the globes have been saved, the fixed and closed irides will make the possibilities of vision depend upon iridectomy under not very favourable circumstances. In the very last consultation on a case of iritis, of which I have notes, the treatment had equally been conducted without dilating the pupil. Mercury, leeches, and lotions were in use; a darkened room and an antiphlogistic diet were all in use when I was called; but the vision was extremely misty, the pupil contracted, and the patient in proportionate danger of "false pupil" from the effusion of lymph, and of loss of sight.

Now I do not think that I shall be using an exaggerated form of expression, or going beyond the strict and well-balanced weight of words which is necessary to give due force to the fact to be conveyed, if I say that we could, in the treatment of ophthalmic disease, better afford at this day, so far as our knowledge of disease and means of mastering it extend, to dispense with all other drugs, lotions, and applications put together, than with this one *topical* medicament. Let us consider what atropine does for the inflamed eye. It allays local sensitiveness, and removes local spasm; it gives to the eye and to its internal muscular apparatus—iris and ciliary muscle—physiological rest, the greatest of all curative means. Nor does it do this only, but, in dilating the pupillary aperture, it drives far from us the bugbear which long haunted the ophthalmic surgeon, and which still pursues those who are not sedulously active in the use of atropia—closure of the contracted pupil by an adherent plug of lymph, and gluing of the uveal surface of the iris to the lens. It would rob the consulting-surgeon of a great many profitable but trying operations, if the atropine eye-drops were ready in every surgery, not only on all emergencies, but for the exigencies of daily practice. It is as safe a rule in ophthalmic practice to use an atropine drop when in doubt, as in whist to play a trump. I can hardly think of more than one absolute contraindication, and that is the existing oval dilatation of the iris in glaucoma. There are, of course, also mechanical contraindications, as in peripheral wounds of the cornea with hernia of the iris, where to dilate the iris is to increase the peripheral protrusion; but even here, the moment the corneal gap is healed, atropia becomes of the first necessity. But in all cases of iritis, in contusions and injuries of the eye, in corneitis, purulent ophthalmia, scrofulous ophthalmia, and deep-seated mixed inflammations of the eye, the local instillation of a solution of atropia is the most precious of therapeutic means. The most useful strength is, I think, expressed in the formula: Neutral sulphate of atropia, two grains; glycerine, five drops; distilled water, an ounce. The frequency of the use of the drop must vary with the facility and rapidity with which it acts. Where the iris has become much inflamed before local treatment is adopted, it is sometimes very indocile, slow to respond, and hard to dilate. Then the measure of frequency must be the amount of resistance, and perseverance must be the rule of treatment. In the treatment of keratitis and minor cases of deeper inflammations, one application a day, or at most two, will suffice; and presently, once in two or three days. It will be enough then to keep the pupil dilated, and the ciliary apparatus at rest and free from tormenting spasm. The present result of the most careful observation of the origin and cause of ophthalmic disease, pursued with the advantages of the improved methods of optical diagnosis now at our command, is to simplify our treatment, and to ostracise a majority of superfluous agents of medication. With a little cotton-wool, alum, and glycerine, hot and cold water and atropine, and a pocket-case of instruments, we can treat with a previously unattainable success nearly the whole range of ophthalmic diseases. I am speaking of local and surgical treatment. Ointments, poultices, caustics, irritants, scarifications, venesections, blisterings, and setons, may be looked upon almost as things of the past. The medical, dietetic, and hygienic treatment are favourably modified, and simplified to an almost equal extent, by the intelligent study of diathetic indications; but the whole shopful of topical applications may be left aside by the surgeon who will thoughtfully apply the vast resources of the few simple agents I have named; and of them all, atropine is greatest. I will not undertake to say that mercury is useless in the treatment of some forms of (syphilitic) iritis; but I will affirm that I have repeatedly seen iritis occur and run a very severe course in patients previously and at the time already under the influence of mercury; and that, in a long series of cases which I treated by atropia and careful dieting only, and without mercury, during five years at St. Mary's Hospital, the results were so excellent that I could not affirm that they would have been improved by the most guarded and judicious use of mercury. A number of these cases were seen by my colleague Mr. Gascoyen, who took part in the experiment.

It is possible, though not easy, to abuse atropine. It must not be used, as I have said, in glaucoma or in peripheral wounds of the cornea. A case or two of troublesome constitutional symptoms, through absorption of the excess by the lachrymal mucous membrance, have been recorded. This is never likely to occur with ordinary care, and I have never seen it occur; but it may be well to bear it in mind in treating infants. The most convenient and unfailing application may be made by the use of the atropised gelatine discs which I introduced a few years since, and which are now largely used in this country and abroad. They are always ready, do not spoil by time, and are clean and precisely dosed, each disc containing as much as a drop of the solution I have mentioned.

I do not think I have spoken too strongly of the advantages in practice of a free use of the local instillation of atropine. In cases of doubt, it will often throw much light upon an obscure condition; and those not much given to study ophthalmic cases will be presently surprised to find how often it will, in a dubious case, first display, and then rectify after a few days, recent and unsuspected adhesions of the iris. In the average run of ophthalmic cases, whether for the treatment of a large proportion of the inflammatory disorders of the eye, by securing anæsthesia and physiological rest, or in the diagnosis of optical defects, it is of ever-recurring use. Few things would tend to curtail the extent and to increase the success of consulting practice, more than a judicious prodigality by the general practitioner in the local use of atropine.—*British Medical Journal, April* 27, 1872, *p.* 445.

66.—ON SOME AFFECTIONS OF THE EAR.

By Dr. W. B. Dalby, Aural Surgeon to St. George's Hospital.

Foreign bodies in the meatus are generally put there by children at play, and are chiefly stones, beads, peas, and the like. With regard to their removal, two points should be borne in mind. In the first place, that as the meatus is lined by skin continuous with that of the auricle, provided the edges of the object are not sharp, they may remain there for an indefinite period and do no harm. In the second place, that very considerable injury is often done by injudicious efforts which are made to extract them. It is not, however, to be understood from this that no attempts should be made to remove them. But no instruments should be used, excepting when, with the mirror on his forehead, light is reflected down the meatus, and the operator, with both hands free, can see what he is doing. The first thing to be done in any case is to syringe the ear; and in doing this the nozzle of the syringe, which should be fine and probe-pointed, is to be kept at the upper part of the meatus, so that the returning stream of water may bring it away. This not happening, if it is near the external orifice, or at any rate not more than half way down the meatus, and especially if it be of a soft nature or of an uneven shape, it may often be laid hold of by a pair of ring polypus forceps. A loop of silver wire may sometimes be passed beyond it, and by pulling at this it may be moved outwards; or the noose of a Wilde's snare may be used in the same way, and the body sometimes by this means be secured and extracted. Young children must have chloroform, not because they are being hurt, but because they will not keep quiet; and without this it is impossible to do any good. Adults will sit still in a chair, as they are not put to any pain. If the foreign body cannot be removed in one of these ways, or if it have passed more than half way down, for the reason shown when speaking of the shape of the meatus, any further attempts will assuredly only have the effect of sending it further in, and will frequently result in a rupture of the tympanic membrane. The ear should be occasionally syringed, and the foreign body will gradually approach nearer and nearer the orifice, until it finally drops out. It may be weeks, or even months, before this happens, but, if it be left alone, it will do no harm. If the tympanic membrane be unfortunately ruptured, this is generally followed by suppuration in the cavity of the tympanum, a discharge from the ear lasting a long time, and more or less permanent deafness. After such an accident, if there be much swelling of the meatus and pain, a few leeches in front of the tragus, followed by fomentations, will be advisable. Anything more energetic than the treatment suggested in the case of foreign bodies in the meatus is thought more likely to prove harmful than beneficial, notwithstanding the numerous instruments that have been brought forward, it is said, with the object of getting behind the body and removing it.

In addition to the *deafness induced by cerumen* when it blocks up the meatus, there is frequently *tinnitus*, and sometimes of the most distressing character. Anything which causes undue pressure of the stapes on the fenestra ovalis will produce it, and in this case it is brought about by a plug of wax directly in apposition with the tympanic membrane, thus transmitting pressure through the malleus and incus on to the stapes. The same exciting cause will often induce attacks of giddiness, and this symptom has occasionally existed for years without eliciting a suspicion of its cause, the patient in the mean time having been submitted to all sorts of treatment, without, of course, receiving any benefit. This arose from the fact that there was no accompanying deafness to point to a cause, for in these cases the plug of cerumen does not entirely cover the membrane, and so there is ample room for vibrations of sound to fall upon it and be transmitted as before. As a rule, however, there is deafness as well. Accumulations of hardened cerumen from continued pressure on the membrane, will occasionally produce ulceration of this structure, thus becoming the direct cause of perforation; and in the same way they have occasionally induced partial absorption of the walls of the bony meatus. There are some preparations showing this in the museum of the College of Surgeons. The only legitimate way of removing cerumen is by the use of the syringe, and the best form is one where the nozzle is very small and can be removed from the other part by bayonet action. This form of syringe is quickly filled, and so time is saved; and from the small size of the nozzle the meatus is not blocked up by it. In so simple an operation as syringing the ears there is a skilful and unskilful method of doing it. The auricle should be drawn upwards between two fingers of the left hand, so as to put the whole meatus as far as possible in a straight line, and the nozzle of the syringe should be kept in close contact with the roof of the meatus. If the secretion is very much hardened, it is well it should be softened by a little warm water poured into the ears for a few nights successively. At intervals during the syringing the ear should be examined with the speculum to see if the canal is clear; for if it is so, considerable irritation may be set up by the stream of water falling with force upon the membrane. It is not very rare to meet with patients who having had their ears syringed vigorously when there was nothing to bring away, have had inflammation of the membrane set up, which has ended in a perforation. The wholesale way, therefore, in which people get their ears syringed as soon as they feel deaf is to be deprecated.

One of the most troublesome affections of the external auditory meatus is the formation of small *abscesses*, which may occur at any situation in this canal. They do not seem to be confined to persons of any particular age or constitution. The first symptom is pain in the ear, which in a few hours becomes so acute as to put sleep out of the question. After twenty-four hours or so the meatus in its entire extent will be swollen; sometimes the whole external ear will be enlarged, red, and tender to the touch. The movements of the jaw occasion great pain. There is more or less deafness, in proportion to swelling. If the patient be seen within a day or two of the commencement of the attack, the greatest benefit may be afforded by two or three leeches placed in front of the tragus, just over the articulation of the lower jaw, and followed by fomentations: in this way the affection may be cut short occasionally. When the leeches are applied, the meatus should be filled with cotton wool to prevent the blood getting in. If not checked in the early stage, the state of things described will increase in severity for several days, and, on examining with a probe, one point will be felt to be far more acutely tender than any other part of the meatus. The whole meatus is so swollen that is not possible to see the position of the abscess with a speculum. This point having been distinctly localised, the sooner an incision is made into it the better, as by this the tension of the parts, to which the agonising pain is due, is relieved. The best knife to use is a curved sharp-pointed bistoury, and a free incision should be made as it is withdrawn. After this the patient gets well in a few days. Very frequently, however, he is no sooner well of one abscess than another commences to form, and all the suffering has to be endured again. It is this recurrence that makes the affection such a troublesome one. Sometimes six or seven abscesses will occur successively in the same patient, obliging him to remain in the house for as many weeks, and causing an amount of suffering altogether disproportionate to the gravity of the illness. In recognising this occasional peculiarity in these cases, caution will be observed in promising a patient that he or she will be well within a certain time.

The diffused form of *inflammation of the external auditory meatus* differs from the circumscribed, inasmuch as it does not terminate in abscess, and, as its name implies, in being diffused throughout the integument of the canal. Since the outer cuticular layer of the tympanic membrane is continuous with that lining the meatus, there is always a certain amount of risk lest this membrane become implicated, and for this reason this affection is more serious than the one just considered. It is not strictly correct to describe it as being of two kinds—viz., acute and chronic,—because, although the attacks are acute at one time and chronic at another, their gradations so insensibly pass into one another that an artificial division is practically useless. Children are especially liable to it; and as it is generally neglected among the poorer classes, with them it is not unfrequently the origin of a perforation of the tympanic membrane. It often succeeds the exanthemata, although not nearly so commonly as purulent catarrh of the middle ear spreading along the mucous membrane from the throat. The diffused form of inflammation of the external meatus commences with a feeling of uneasiness and itching just within the orifice, which very soon becomes red, tender, and swollen; and there is pain during mastication. These symptoms increase in severity, until, with the appearance of a discharge, the pain ceases, and the swelling gradually subsides.

Such is briefly an account of its acute stage, which usually occupies a week or ten days. The treatment is palliative—viz., leeches and fomentations; but as this affection does not occur to persons in a good state of health, the diet should be attended to, and a change of air, if possible, be resorted to, for it is most desirable not to let this condition become a chronic one, as it is most apt to do.

Eczema is a common affection of the outer ear, and may be acute or chronic. After repeated attacks (for a patient who has once suffered from it will be very liable to it again) the auricle becomes very much thickened, and the entire meatus shares in the same condition. If there is any deafness, it is only so far as may be accounted for by the narrowing of the canal, which takes place when the disease has lasted for a long time. Like eczema in any other part, it is very obstinate; but if the patients will consent to keep to rules of diet, including an absence of stimulants, they will get well. This is more important than any external applications. Of these, very mild mercurial ointments are, perhaps, the most useful; and before they are applied the parts must be carefully dried.

Exostoses are not unfrequently met with in the external auditory meatus, and are not confined to any situation in its course. They are solid bony growths, covered with periosteum. Sometimes there are two or three at one time, and they scarcely ever have a pedicle. On this account, and from their position, they are not easily removed by an operation. Fortunately, this is not often necessary, as they seldom entirely close the meatus, and so do not interfere very materially by their presence with the hearing, but do so indirectly by secretion of cerumen and epidermis collecting behind them; and in this way may be very troublesome. They have been considered to be the result of a gouty diathesis; and the long-continued use of iodine applied locally has been said to induce a diminution of their size. No evidence of either of these propositions can be found. These osseous tumours, or enlargements of the bony meatus, as the case may be, are of very slow growth, and acquire a considerable size without the patient discovering them.—*Lancet, Aug.* 24, 1872, *p.* 249.

67.—FOREIGN BODIES IN THE EAR.

Dr. Löwenberg has published in the *Berl. Woch.* three very instructive cases, accompanied by judicious remarks, illustrating the proper modes of removing foreign bodies from the external ear. The important fact made evident by the cases is the prejudicial nature of the rough or ill-directed attempts at removal which are generally instantly made when the foreign body is complained of. In fact, such attempts may give rise to inflammatory effusion, which forms a bulging ring around the foreign substance. Dr. Löwenberg also shows that the latter may remain in the outer ear for several weeks without occasioning great discomfort. Also that the foreign body, or the instruments used to remove it, sometimes perforate the membrana tympani; but that this membrane may eventually recover its integrity. We also notice that such perforation may be proved by the reappearance of water injected into the ear at the mouth and nose, or by the forcible expiration when both the latter are closed. In the latter instance bubbles of air will be noticed in the water left in the meatus.

The author relies chiefly on injections of water, and, these failing, on the *agglutinating* method. To carry out the latter, he uses a stem delicately surrounded with lint, the end of which, a little unravelled, is dipped in carpenter's glue. None of the glue should touch the sides of the stem. The latter is left from fifteen minutes to an hour, and the fastening becomes so firm that the foreign body can be extracted by careful management. A bead thus removed has remained attached to the stem for three years. Two cases, after all other means had failed, proved successful with the glue; and a third at once yielded to injections.

A strange circumstance was noticed in a boy of five years. A shirt button had been introduced into the left ear, and was eventually found there; but when the child came under Dr. Löwenberg's notice, the *right* ear was complained of. He saw nothing in it, and when, according to his custom, he explored the supposed sound ear, the button was seen lying against the membrane. The explanation was that, after the first attempts, the boy became so alarmed and confused that he presented to the first surgeon called the right ear, which, in consequence of manipulations, became inflamed, and was looked upon as containing the foreign body.

From the details of the cases it would appear that Dr. Löwenberg is in Paris quite a specialist as regards these extractions. He seems, however, to under value the delicate instruments which have been devised for the purpose. No doubt roughness or blind explorations are mischievous, but proper instruments, used with gentleness and with due regard to the anatomy of the part, should not be despised. The gluing method is very attractive through its simplicity and proved efficacy. The author especially directs attention to the position of the head when injections are used. It should be such as to favour the *vis a tergo* of the stream of water.—*Lancet, June* 1, 1872, *p.* 774.

68.—ON THE TREATMENT OF EXANTHEMAL CATARRH OF THE TYMPANUM.

By Dr. **James Patterson Cassells**, Glasgow.

[These cases are of the greatest importance. They are liable to be overlooked to some extent in consequence of the apparent relative urgency of the accompanying exanthem.]

The acute form of this catarrh is usually met with in children during the course of the febrile attack, particularly when the naso-pharyngeal affection is severe, and is ushered in by increased restlessness and pain, which is referred to one or both ears, with more or less functional disturbance of the organ. After the lapse of a few hours, during which the suffering is intense, an escape of purulent fluid takes place from the external meatus, and relief is obtained. Usually the discharge lasts a few days, and then ceases; the hearing is restored; and the attack passes away without apparently doing damage to the delicate structure.

But this is a favourable termination, for, at other times, the restlessness and pain are quickly followed by symptoms indicative of cerebral disturbance, such as convulsions and coma, which, if the patient is already exhausted, not unfrequently terminate fatally. Many of the patients die apparently from inflammation, or effusion within the head; they have violent headache, with furious delirium; which is followed by coma and death. What proportion of the cases, which have this unfavourable termination, have also an acute catarrh of the ear, with some of the pathological results presently to be referred to, it is impossible to determine in the absence of data. But it is in the experience of most general practitioners, who have observed an epidemic of scarlatina, that young patients, who have suffered from violent headache with furious delirium, and sometimes coma, have had a sudden relief from their apparently hopeless condition, after a discharge of pus-like fluid from the external auditory meatus; so that it is just to assume that the morbid contents of the tympanum, in such cases, exercising undue pressure upon the fenestræ of the labyrinth, had given rise to the alarming symptoms; and that these had disappeared when, by rupture of the membrana tympani, that pressure was removed, and the contents of the tympanum permitted free egress.

But pathological anatomy shows, that this favourable termination does not always take place; that the membrana tympani resists the pressure from within; and the pent up morbid matters, unable to make their escape by the Eustachian tube, already most effectually closed by a concentric thickening of its lining membrane, find their way to the base of the brain, either by breaking through the fenestra cochleæ, or some imperfectly ossified part of the walls of the tympanum; thus causing the death of the patient.

Cases occur, however, in which not only does the membrana tympani resist the pressure, but no part of the tympanic walls gives way; and the more urgent symptoms already referred to subsiding, the patient recovers with the hearing powers more or less impaired. The disease now becomes chronic; the morbid contents of the tympanum becoming more or less inspissated or organised, and the lining membrane and osseous walls hypertrophied, (in addition to ankylosis of the ossicles, or of the base of the stapes to the fenestra ovalis) great, and in many cases, irreparable damage is done to the organ.

It is not considered necessary to multiply proof in support of what has been advanced, it is sufficient to call to mind the anatomical structure and relations of the petrous bone—indeed, of the whole temporal bone. The walls of the tympanum are always thin; frequently imperfectly developed; and have free inter-communication, both vascular and nervous, with the important organs and structures which surround it; while every pathological change in the delicate membrane lining this cavity, from its intimate connection with the periosteum of its walls, gives rise to a disturbance of their nutrition and its consequent evils; every inflammation of the lining membrane of the tympanum and of the mastoid process is an inflammation of the periosteum; every catarrh of the same a periostitis; whilst, with acute processes, the lining membrane is more prone to ulceration, and the periostitis leads more frequently to atrophy; to inflammatory softening; and to caries of the bone; thickening of the mucous membrane, and hypertrophy of the osseous structures readily develop themselves, when the inflammation has become chronic. Moreover, the pathological collections of this country and the continent, as well as the writings of English and continental aurists, show with what alarming frequency death results from a simple exanthemal catarrh, which has run its course untreated.

It is obviously impossible within the limits assigned to this paper, to indicate all the varied morbid appearances which the membrana tympani presents in this form of aural catarrh; but usually if the membrane is inspected in the acute form, a proceeding which should never be neglected in the course of scarlatina, especially where symptoms appear indicative of an extension of the throat affection along the Eustachian canal, it will be found of a yellow or brownish yellow hue, particularly at the lower segment; lustreless and opaque; with more or less convex bulging: and with one or more injected vessels running parallel to the handle of the malleus; while a zone of minute vessels occupies the circumference of the membrane, or may even cover its whole surface, giving it a red and velvety appearance. If the membrane, however, is about to give way before the pressure of the contents of the tympanum, the part at which it is likely to rupture, will present a bright or greenish yellow colour, and is much projected externally.

In the chronic stage the appearances of the membrana tympani are totally different. The colour may be white or stone-grey, with a yellowish tinge; lustre more or less gone; and opaque in whole or part; sometimes the transparent portions permitting the observer to verify his diagnosis by an inspection of the contents of the cavity, or of its lining membrane. The curvature of the membrane may be normal or present any degree of departure from that standard, up to well marked convexity, in whole or part; and, in addition, some injected vessels ramifying upon its surface; although these latter are not of frequent occurrence in the chronic stage of this disease.

In the foregoing brief and necessarily imperfect account of the disease, the appropriate treatment in the acute stage, naturally suggests itself; viz., early and free incision of the membrana tympani; and in the chronic form, as part of the treatment having for its object the removal of the unorganised deposit contained in the tympanum, incision of the membrane is as clearly indicated.

The operation is performed, with a delicately constructed lancet-shaped knife, in the following manner:—

Having obtained a good view of the membrani tympani, the knife is passed quickly through the membrane, near to the inferior margin of the posterior inferior quadrant, cutting upwards for about 5 m.m. (3 lines) in the posterior segment; in acute cases incising by preference any part of the membrane more protuberant or convex externally. In the first introduction of the knife, care must be taken not to wound the inner wall of the cavity, else the hemorrhage which follows, and the coagulæ that form, may mar the success of the operation. In order to avoid this, it is advisable to Politzerise, immediately previous to the operation, or to cause the patient to inflate the ear by the Valsalvian method at the moment the knife is introduced, when either proceeding is admissable. Usually some of the morbid matter escapes immediately on the withdrawal of the knife; the quantity depending upon the consistence of the contents of the middle ear.

The after treatment in acute cases consists in occasional Politzerising to facilitate the outflow of the purulent fluid, and the observance of scrupulous cleanliness: after a few days, if the discharge does not cease, the instillation of a warm astringent lotion (zinci sulphas gr. ii. and ℥ i. aquæ). The necessity for a repetition of the operation, within a few days, may arise; this is to be determined by circumstances, and needs no further consideration.

When the case is already chronic, before coming under observation, and the signs of occlusion of the tympanum, by morbid deposits, are well marked; or the history is suggestive of such a condition; the following method of treatment is adopted. It is a combination of that of Politzer for chronic mucous catarrh, and of Hinton for chronic mucous accumulation around the auditory ossicles.

Having ascertained that the Eustachian tube is patent, or made it so, either by Politzer's method, or by passing a stream of compressed air through it, a small quantity of a perfectly transparent and warm (100° F.) alkaline solution (5 per cent. soda of bi-carb.) is injected daily, through a vulcanite catheter into the tympanum, in order to soften the morbid matters retained there. After each injection Politzerising with the object of lessening the congestion and hypertrophy of the membrane, and of the Eustachian tube; and in some degree diminishing the probability of secondary inflammatory action following the operation of incision, as well as rendering the Eustachian canal more patent. After some days of this preparatory treatment, the operation is performed in the manner already described. Immediately after the incision the tympanum is washed out with a warm solution of common salt, either with a syringe, the point of which is tipped with india-rubber, and fits tightly into the anterior orifice of the nasal passage; or through a vulcanite catheter introduced into the Eustachian tube of the affected ear. The latter method *must* be used unless both ears have been operated upon at the same sitting, when the former is preferred. Usually, by this proceeding, some of the morbid deposit is forced out into the external meatus, from which it is easily removed, either by the forceps or by gentle syringing. The tympanum is then washed from the meatus ext. by a large syringe, the nozzle of which fits accurately into the orifice of that canal, and is prevented from injuring it by a protecting ring of rubber affixed to its point. The patient is directed to lean forward, and to breathe through the mouth; the syringe filled with the warm solution is applied to, and pressed into the orifice of the meatus, and the fluid forced through the ear. At first the pressure must be gentle, until the fluid begins to run from the anterior orifice of the nasal passage, then more pressure may be employed. Oftentimes, considerable force is necessary to dislodge the deposit; the quantity removed in many cases is very large. This treatment is repeated every day till the incision closes.

Sometimes patients complain of giddiness, which soon passes off; this symptom has been ascribed to the coldness of the fluid injected, but it appears rather to be caused by pressure upon the fenestræ of the labyrinthine wall.

With the fluid warm; the incision large and free; the pressure prudently applied; and the Eustachian canal *open*, no danger need be apprehended; further, the operation and the after treatment may be repeated, without in the slightest degree injuring the organ.—*Glasgow Medical Journal, Aug.*, 1872, *p.* 470.

AFFECTIONS OF THE SKIN.

69.—ON THE GENERAL PRINCIPLES OF CUTANEOUS THERAPEUTICS.

By Dr. Tilbury Fox, Physician to the Skin Department of University College Hospital.

[There are many purely local diseases which require local treatment only, but, on the other hand, these diseases may occur in a badly nourished subject, and consequently demand a judicious combination of general and local treatment.]

There are one or two special points in the therapeutics of these cases. I may say generally that in these diseases the proper treatment is that which we adopt for pyrexial diseases in other parts of the body in the early stages, and is subsequently such as is of a tonic nature, and finally that which is calculated to remove chronic inflammatory thickening or the like. But there is something more than this to be considered. It is not enough to adopt a treatment recognised as suited to a particular disease. There are a number of influences that modify disease in different subjects, and that require to be carefully attended to. These influences are of very common operation, and arise out of the peculiarities of the patient. The dermatologist must determine not only what is best for individual cases, and how far the specific or formulated treatment for particular diseases should be added to, or modified, to suit these diseases in particular individuals. In fact, the treatment of the cases of skin diseases now under notice should be a combination of the remedies suited specially to the particular disease present, with those suited to the concomitants of the individual case. The following are the modifying influences to which attention should be given.

Firstly. It is important to recognize the great influence which scratching possesses in exaggerating certain diseases. Nothing is of more consequence than the use of special remedies calculated successfully to allay the irritation which forces the patient to scratch, and to protect and to soothe the parts when scratched.

Secondly. The influence of general debility is at work not only to retard recovery in, but to favour the development of many diseases to a more severe degree than would otherwise be the case. It is not a question of debility *producing* this or that malady, but *modifying* the same. The debility may express itself mainly in the form of anæmia, want of nerve power, &c.; and special and appropriate remedies given with a view to meet these several states will lead to an improvement in the general health, and thus indirectly favour the cure of any diseased condition about the skin; for it does not need any proof from me that the nearer a man approaches in his condition the standard of health, the sooner and more certainly will he throw off any disease about him, be it in his outer or inner surface or parts. But in practice we much forget that the specific should be linked with general treatment. And the relief of the debility of persons afflicted with diseases of the skin is to be accomplished not only by the use of medicines, but by mental and bodily rest, change of air and scene, and the like. These matters are by no means sufficiently considered.

Thirdly. Every attention must be paid to dyspepsia as affecting the origin and course of skin diseases. It gives rise, of course, indirectly to debility, to torpid action of the liver, to the generation of acridities that float about in the blood, and circulate freely through the skin to disorder it; and lastly, it increases cutaneous hyperæmia by reflex action. Dyspepsia must therefore be regarded as a powerful intensifier of all hyperæmic skin diseases.

Fourthly. The circulation of retained excreta is always a cause of intensification of hyperæmic conditions. The blood charged by excreta, in passing through an eczema or a psoriasis, will irritate it, if I may so say, and thus necessarily tend to give it an inflammatory character, whilst the process towards cure will be retarded. I believe this to be one of the most important of all points to be attended to in treating diseases of the skin, and the principle is of almost universal application. It is a matter of common sense (but matters of common sense are apt to be very much neglected) that a poisoned blood-current—poisoned, *i.e.*, "charged," with bile or nitrogenous matters which we know must disorder the tissue nutrition and vascular tension—will not permit the cure to be accomplished so easily as if the blood were uncharged with the same elements; and the removal of the latter will help the cure of disease, and that oftentimes in a marvellous manner. Now, whence the excreta to charge the blood? From defective assimilation, as in dyspeptics, torpid liver action, and from excessive waste; or from defective excretion, by the skin, the kidneys, and the liver. The skin has to get rid of a certain amount of effete products; and if the skin acts sluggishly or scarcely at all, this may impurify to some degree the blood-current. So, again, deficient kidney action tells its own tale. The non-excretion of bile products in the usual way, and their passage into the blood-current to circulate within it, is another cause of skin mischief, as in some cases of erythema, urticaria, and probably purpura. The severest case of general eczema I ever saw was excited by the circulation of bile through the skin in connexion with a most marked attack of jaundice. Of course in such a case the influence of the retention of the non-eliminated products is readily appreciated, but in other cases readily overlooked. There are minor degrees of blood-impurification by bile, urea, and the like. It seems to me that the treatment of diseases of the skin is essentially the physician's work and not the surgeon's, for the very reason of the connexion between skin maladies and functional and structural changes in internal organs.

Fifthly. Deficient renal action, particularly in reference to the quantity of fluid discharged, is another matter of prime moment in regard to skin diseases. I am convinced that we do not, when the skin is disordered, sufficiently make use of the kidneys to relieve the skin of its work. There are three conditions in connexion with diseases of the skin in which the kidneys should be freely stimulated to active excretion of fluid: (1) Where, in consequence of organic disease of the heart or other cause, and in connexion with a sluggish circulation, there is a distinct tendency to fluid accumulation in the tissues. (2) In all cases of hyperæmic skin disease, and in the early stages of inflammatory diseases, where the blood tends to accumulate in the skin in connexion with pyrexia. And (3) in diseases of the legs, where there is the slightest tendency to local or general œdema. In inflammatory diseases of the leg diuretics greatly counteract the injurious effects of mere gravitation, and they tend to relieve the engorged tissues. Diuretics are useful under all these circumstances, and emphatically so where the quantity of urine is already deficient. But I hold that in diseases of the skin generally a deficiency of urine calls for free stimulation of the kidneys to relieve the disordered skin of its work as much as possible. Of course where there is free circulation with the blood of retained excreta the necessity for free kidney action is increased tenfold. The liberal administration of diuretics in a case of eczema of the legs in a gouty subject will often act like magic when all other remedies fail.

Sixthly. Gout and rheumatism have their special influence upon skin diseases. I might have referred to these modifying influences under the last head, for it is the excess of uric acid in the one and the presence of lactic or an allied acid in the other case, and the circulation of blood charged with these products through the skin, that cause special mischief in skin diseases, *and give an inflammatory or irritable aspect to them.* The older practitioners, in attributing to gout and rheumatism the causation of disease which we now deem independent of them, were even nearer the truth than are some modern observers who hold excessive belief in the local origin of disease. If gout does not *produce*, it often *modifies* skin mischief, as above stated; and, after all, our forefathers were only at fault in regard to the use of terms. It is not an uncommon thing to have this or that eczema or psoriasis or lichen called gouty eczema, gouty psoriasis, gouty lichen. Practitioners have found that by treating patients affected by these forms of disease for gout or rheumatism, as the case may be, the maladies have often speedily vanished when other measures have failed. They have imagined that the gouty blood has caused the disease. It would be more correct to say it modified, it irritated, the disease, and so prevented the cure from taking place. With this explanation there can be no difficulty in seeing that gouty and rheumatic dispositions exaggerate hyperæmic conditions in skin diseases, and give an inflammatory aspect to them very frequently. The removal of gouty influences must aid the cure of skin diseases.

Seventhly. The tuberculous and the strumous diatheses also, it must be remembered, considerably modify certain skin diseases. The tendency in the phthisical and phthisically inclined and in the strumous is to a particular perversion of cell-growth in certain of the tissues, and notably the fibro-cellular; I refer to the tendency to the production of pus. Now it will be readily understood that this must have much influence upon local tissue-change in skin disease. Given the occurrence of a local inflammation in a non-strumous and a strumous subject, there will be differences in the two instances accounted for by the operation of the pus-producing tendency in the one and not in the other. It must be so. The tendency to the morbid cell-growth, which may not have shown itself in action before, will be likely to do so when nutrition is disturbed by local inflammation, disordered innervation, &c., as the case may be. The strumous tendency takes occasion by the perversion of local nutrition to give evidence of its presence and to complicate matters. Of this fact experience assures us. Take the case of an eczema: if it occurs in a strumous subject, it is accompanied by free pus-production. Acne in a non-strumous and acne in a strumous subject are different. In the latter case, the fibro-cellular textures of the wall and about the gland are implicated and inflamed, often presenting the appearance of the livid-red and the indolent tubercular swelling of a strumous tubercle, whilst the acne spots suppurate freely and leave behind scars, indicative of the tendency to ulceration, which is another feature of the strumous habit. This is a simple but it is an important point in therapeutics, and, because simple, often disregarded as of no moment. In psoriasis, in strumous subjects, the tendency to the production of pus is seen, and in this statement I am confirmed in my original opinion by my friend Dr. R. W. Taylor, of New York, an excellent observer and worker. Therefore, in regard to phthisical and strumous subjects, whilst one treats the local disease, be it eczema, erythema, lupus, acne, or psoriasis, it is of great use to neutralise, by the conjunction of anti-strumous remedies, the bias of the general nutrition towards free pus-production, which will of course express itself in proportion as the diathesis is marked and the local derangement of nutrition severe.

Eighthly. An old syphilitic taint is to be carefully detected and dealt with in reference to skin diseases. This should be recognised as a distinct and special cause of chronicity in certain non-syphilitic eruptions. The tendency of fully-developed syphilis in the human subject is to produce a new growth in the fibrous textures, or to give rise to a modification of the normal cell elements of these parts. The altered or new tissues we call "granulation tissue." Now, when syphilis modifies ordinary skin eruptions, it does so by impressing upon them more or less of the characteristic tissue change it ordinarily produces, and in doing so may antagonise to some extent diseased processes peculiar to the disease which it modifies. Eczema may illustrate what I mean. The characteristic of eczema is the occurrence of serous catarrh in the papillary layer of the skin as the primary condition; but if eczema occur in a syphilised subject, and the syphilis be active, then the tendency of the syphilis towards the formation of the granulation tissue may show itself, and the "serous effusion" may in part give place to the formation of new tissue—*i.e.* the two processes may be more or less intermingled, or rather, I should say, the result is a compromise. This is exactly what we should be led to expect from an examination of the naked-eye characters of eczema in a syphilitic subject. There is less discharge and more thickening than usual, and than we should be led to anticipate. So in psoriasis there is more thickening, less scaliness, and less vascularity, because the syphilitic tissue invades and presses upon the vessels in the normal tissue. Hence the effect of syphilis on ordinary skin diseases is to render them less typical, in regard to naked-eye characters and to their course, because the additional element of syphilis retards the cure, whilst there is the superaddition of the element of "thickening" or "deposit" (granulation tissue). Whenever I meet with a case of *unaccountable* chronicity I suspect that a syphilitic taint is in the background; and, for my own part, I believe that syphilis is a modifier of disease in local inflammations to a greater extent than has yet been expressed in any writings. Syphilis does not give evidence of its presence, as regards skin affections, until some strain is put upon the nutrition of the tissues, and then an explosion takes place. A strain is put upon the nutrition of the skin when a local inflammation occurs, its normal resistant power is lessened, and thereby syphilis, taking occasion by the weakness, shows itself in action as a modifier of the inflammatory process as described. A very familiar illustration of the fact that syphilitic complications or special development of latent syphilis in the system show themselves under such circumstances, is afforded by the outbreak of tubercular syphilis around a wound—about the shin, for example. What would be a simple wound in a healthly subject takes on unhealthy ulceration or syphilitic pustules, or tubercles develop about the seat of injury in subjects in whom syphilis is latent, but which has given no sign of its existence to the physician before. In like manner skin affections seem to excite latent syphilis at times into activity, and are thereby modified by it in the way I have indicated. I know of no more important point than this in cutaneous therapeutics. If we treat the syphilitic taint we shall much more speedily and certainly cure the disease which is present.

"Chronic inflammatory thickening" is a matter upon which a few words must be said. In some cases this condition is found to be developed out of proportion to the degree of antecedent hyperæmia both as regards its severity and its duration. My own belief is that in such cases it is to be explained by the existence of the strumous diathesis in the individual concerned, which often at once accounts for the infiltration of the fibro-cellular tissue with a low type of lymph, or the formation in it of a new tissue of a less perfect kind. At other times an old syphilitic taint may best explain the occurrence of thickening. At all events a mercurial course sometimes does wonders, as we all know. Of course long-continued hyperæmia in a person free from the two diathetic tendencies named will lead to "chronic inflammatory thickening." I am now particularly referring to cases in which thickening and induration either rapidly show themselves, or in such a manner as to strike us that it is due to some special tendency of the textures to hypertrophy rather than to the hyperæmia itself, which perhaps has been but slightly marked.

Ninthly. There is a class of phenomena connected with reflex action which it is of some moment to pay attention to in treating skin diseases. He who would deal with the matter scientifically must never concentrate his attention solely upon the mere local changes in these diseases, but must especially be on the alert to discover, in disturbance of the nervous system, the frequent reason of the intensification of hyperæmic conditions in the skin. I have seen not unfrequently a redness of the skin produced by mental excitement or sudden fright in "nervous subjects"; and there can be very few who have not known an eczema rubrum made immediately very much worse by the same influence. Depression and mental excitement play great parts in aggravating hyperæmic conditions of the skin. That uterine mischief occasionally intensifies acne rosacea, that dyspepsia frequently makes acne much worse, and the like, are facts belonging to the same category.

Tenthly. The hygienic surroundings of patients must always be carefully taken into account in the treatment of diseases of the skin, in reference especially to the class of cases particularly under consideration now. It is in this respect that the treatment of hospital and private patients of the better class differs so much. The confined living-rooms, the breathing of impure air, the defective diet, and the neglect of cleanliness, are influences that aggravate skin diseases in the poor as compared with the rich. It is cleanliness and feeding up, with fresh air, that the poor want, in many cases of disease which would be relieved by purgatives and alkalies and nervine tonics amongst the better classes.

Now the several modifying influences referred to under the foregoing heads may be present in different combinations, and it is the full recognition of this fact that leads to success in the treatment of skin disease.

[In another number of the *Lancet* Dr. Fox refers to the hyperæmias, the simple inflammations in the debilitated, eczema, ecthyma, psoriasis, acne, pemphigus, &c.]

I am the advocate for a much more soothing system of treatment than that usually adopted for these diseases, of which hyperæmia is so frequently a part. And this leads to the question, What should be the object of our local measures? It is threefold: (1) at the outset, to *moderate* diseased, especially inflammatory, action; (2) to *protect* the diseased, and therefore weakened, parts; and at length (3) to *stimulate*, with the view of rousing the dormant tissues into due activity, and causing the removal of morbid depositions and formations. My own conviction is that, in the early stages of hyperæmic skin diseases, much of our current treatment is mischievous by reason of its activity. A soothing plan of treatment is wanted in all cases of early cutaneous congestions. By soothing treatment I mean one which diminishes congestion and secures an exclusion of air—one which, in fact, puts the skin in a state of rest. *Heroic* measures, designed to cut short an early congestive stage of a skin disease, often render the course of that disease chronic and persistent. In the early stages, before the deep vessels are involved, much can be done to check congestion by mild applications; whilst active measures do harm. For instance, in acute general psoriasis I have often seen aggravation of the congestion follow the use of tarry applications; while great relief has been produced by alkaline and bran baths, and subsequent oiling of the surface. I am not by any means an advocate of an expectant plan of treatment. I advise potent remedies to be employed after the congestive stages have passed. The dangers of over-stimulating are not imaginative; and they are plainly made apparent, in cases accompanied by active hyperæmia, by much irritability, or by a tendency to degenerative change in the skin, in the spread of the disease, and its undue chronicity.

I may refer to the local treatment of certain instances of lupus, *quoad* hyperæmia, in illustration of what I mean. Sometimes we have a patch of lupus on the face, which is very tender, very hyperæmic, and which exhibits a tendency to spread—that is to say, there is a tendency in the apparently healthy tissues to become the seat of the cell-growth which is the characteristic of lupus. In these cases the exclusion of air and the use of mild non-irritating astringents will do good by diminishing hyperæmia; whilst the use of caustics will be sure to cause the disease to spread, because it will greatly increase the hyperæmia of the parts around, and so favour the development of the peculiar cell-growth. In fact, if one still further disturbs the already weakened disease-tending tissue, one is, of course, likely to favour disease. This is also true of simple acne, pityriasis, rubra, &c.

Now for the details of local treatment.

First, as regards *moderating* inflammatory action. It will naturally occur to anyone first of all to remove special causes of local irritation in the case of hyperæmic skin affections. There are two sources of mischief I may specially refer to; they are (*a*) the wearing of flannel next the irritable skin, and (*b*) scratching. I think flannel should never come in contact with an irritable skin; it is a great source of irritation. It may be worn outside a linen garment, and the patient will not, under such circumstances, catch cold. The disuse of flannel is important in nettlerash, pruritus, eczema, scabies, the erythemata, &c. Scratching does an infinity of mischief. The usual plan for preventing it is to use some sedative lotion. I think it of great importance to employ emollient and alkaline baths freely, to allay irritation in the early stages of the local inflammatory cutaneous diseases, and to subsequently protect the parts by appropriate coverings and applications; and by internal remedies remove all cause of pyrexial disturbance, or alter such blood impurifications as lead to an intensification of the hyperæmia of the parts through which the blood passes. The baths which are best adapted to moderate inflammatory or irritative action in the skin are bicarbonate of soda, 2 to 4 ounces, size from 4 to 6 or 8 lb., poppy and bran. The patient may remain in for ten minutes or so, and the skin should not be rubbed dry, but patted with hot towels. It is a good plan to oil the skin subsequently, or to powder it with oxide of zinc, or to apply a simple calamine lotion. But we must take care to use such means in due conjunction with general remedies. If bile products of ureal compounds are in abundance in the blood, free purgation, or diuretics employed with a liberal hand, must not be neglected. Pyrexia must be met with appropriate drugs and dieting. In like manner the pain and hyperæmia of an eczema in a gouty subject may be greatly moderated by an alkaline bath, but a good dose of colchicum in addition will bring the greatest relief. The exclusion of air from inflamed and hyperæmic irritable parts is a matter of great consequence, and the more so if the irritable part is denuded of cuticle. The air is very stimulating to such parts; absorbent powders and neutral unguents are here called for. Then it is also very desirable to prevent evaporation taking place from scratched surfaces, or surfaces denuded of their natural protecting layer of healthy cuticle, for thereby they become harsh, hard, and tend to crack. I know nothing so good for the purpose as Kirkland's neutral cerate.

I don't know that I can find a better place to make one reference to the use of water-dressing to indurated and irritable parts, made all the more troublesome by scratching. There can be no doubt that the use of a water pad, which permits the diseased surface to absorb moisture and so becomes more or less soft and supple, does give great relief; but this is oftentimes succeeded by the recurrence of itching, pain, and, it may be, increased cracking and stiffness or tension. The explanation is not difficult to give in regard to some cases at least. The part has become denuded of its cuticular covering, and, whilst it absorbs moisture freely, it also parts with its moisture equally freely unless prevented. Whenever I use water dressing to an excoriated part, I invariably direct that a layer of greasy matter shall be applied, and kept applied, on the removal of the compress. In this way the absorbed moisture is retained, and the parts keep more or less soft.

But I am touching upon the second point—viz., the *protection* of hyperæmic and irritable parts; and, indeed, to *protect* is, under such circumstances, to *moderate* diseased action. To protect is to prevent scratching and the stimulation by the external air that gains access to the part and to secure rest, as it were, to the diseased parts: and to negative the operation of special external irritants. In addition to the use of absorbent powders and neutral unguents, one may employ cotton-wool, bandages, and strappings, which I need not now discuss at any length. The use of bandaging and strapping is particularly to be commended where the effects of gravitation are noticeable—in the legs, for example. The bandage prevents undue distension of the vessels and the escape of serosity into the textures, thereby giving the parts a better chance of recovering their tonicity. This simple matter is much neglected in regard to cutaneous diseases. Not only in the leg, however, but in other parts bandaging and strapping act similarly, where the tendency to engorgement of the tissues and vessels is shown.

The third object of local treatment in the diseases with which we are dealing is *stimulation*. One of the chief things the dermatologist should set himself to determine is the exact time at which his soothing kind of treatment should cease and his stimulating remedies be employed. It is at the moment that the irritability of the bloodvessels and the nerves is subsiding that the use of powerful astringents and stimulants is so efficacious, and that it is possible to do the most towards a speedy cure of disease. What happens in the inflammatory eczema, the acne, or the psoriasis? After a while the vessels lose their tonicity and become dilated, favouring the "effusion of inflammatory products," giving rise to œdema, "chronic inflammatory thickening," &c. Now, it is at the moment that the parts are becoming less inflamed and irritable that astringents, lead, zinc, nitrate of silver, mild mercurial preparations, and the like, are of use to restore to the vessels their tone; and if at the same time our general remedies assist nature by removing impurities from the blood, by restoring the balance between absorption and excretion especially of the watery matter of the system, and giving general tone to the body, the patient will probably get rapidly well. The application of sulphur at the nick of time indicated speedily cures an acne that had been irritated before by the same remedy. The same may be said of the use of nitrate of silver to an eczematous patch. The use of tar to a psoriasis which is markedly hyperæmic at a very early stage will often spread the disease, or bring out fresh places. If matters still do not mend, but the disease holds on, one needs to stimulate, or, as we say, "rouse the torpid tissues to activity," but as I should put it, to quicken the activity of the absorbents in order that effused and formed products may be removed. It is really not so much in chronic inflammatory skin diseases that we need fresh remedies, as to use those we have reasonably, as regards time and circumstances. This is emphatically so as regards eczema and general psoriasis. But what are the indications that local soothing remedies are still needed in a disease, and the time has not come for stimulants? I think the main ones are as follows:—The tendency of the hyperæmia or the disease to spread; the development of new spots of disease, showing the disposition to the implication of healthy parts, which would be favoured in its development by anything which irritated such parts; the presence of much pain or heat in the parts; and manifestly the marked hyperæmia. But I lay most stress on the two former features. I like to let hyperæmic conditions in skin disease "quiesce," as it were, before I leave off my soothing treatment. But a disease having "quiesced," its hyperæmic condition having diminished, and the disease showing no tendency to spread or to spring up in new places—*e.g.*, acne, eczema, psoriasis, and pemphigus,—then stimulation can be appropriately adopted. And for what reason are stimulants used? First, to restore the tonicity of vessels; and one must not forget here that artificial pressure by bandages, &c., is a great assistance where gravitation comes into play to distend the vessels, as about the legs. Secondly, to alter the character of a discharging surface. Such is the action of a weak mercurial ointment in a case of chronic eczema. Thirdly, to check the formation of scales, as in the use, against psoriasis, of tarry preparations; and, fourthly, to cause the absorption of inflammatory or heterologous formations; the iodides, mercurials, the soap treatment, blistering, and the like are specially referred to under this last head. But in regard to the use of stimulants and revulsives, I hold equally, as concerns their application, that their efficacy will depend greatly upon the judicious conjunction of internal remedies. I mean that, supposing that the blood of a patient in whom we use these external means is charged with uric acid, he will have a much smaller chance of gaining benefit from the application of revulsives than one who has a pure blood-supply passing through the diseased part. In the former the blood-state may take occasion, by the unbalancing of the nutrition induced by the use of the local remedies, to increase the hyperæmia, or to set agoing an inflammatory action again. The success of stimulant applications, in fact, will be in direct proportion to the degree in which the individual's condition approximates that of health. One very potent method of stimulating not only the skin but the system generally, and emunctory organs in particular, is the use of sulphur or sulphide of potassium baths. They should not be employed in the acute stages, but in the chronic forms of psoriasis, eczema, lichen, and acne. Where there is not much irritation or hyperæmia, and where the latter does not seem to be readily increased, they are most useful.—*Lancet, June* 1, *and July* 20, 1872, *pp.* 751, 71.

70.—SOME REMARKS ON THE PATHOLOGY AND TREATMENT OF ACNE.

By J. L. Milton, Esq., Surgeon to St. John's Hospital for Diseases of the Skin, London.

Acne may be briefly defined as occlusion of, sometimes with increased secretion from, the ducts of certain sebaceous glands, attended by thickening, hardening, inflammation, or suppuration. Such pustules as occur maturate very slowly. All the disorders usually classed under this name may be reduced to:—1. Acne punctata (*amedones*, grubs), in which there is simply occlusion of the sebaceous ducts, with formation of black specks at the orifices, accompanied by elevation and hardening of the sides of the openings; contents composed of epithelial cells, oil-globules, some fine hairs, and cholesterine; may inflame and turn to acne simplex,—when hard and horny, often called stone-pock (*a. indurata*). 2. Acne simplex, in which this state is accompanied by formation of hard inflamed papules round the orifices of the ducts, and frequently by suppuration. 3. Acne rosacea,—more an erythema, accompanied by papulation, than a pustular disease; distinguished by vivid red patches on face, sometimes with a dry and profavaceous condition, at others by a greasy state of the skin, though, indeed, some degree of seborrhœa may attend every variety of acne; suppuration occasional; pustules often painful and stiff; occasionally varicose dilation of minute superficial veins. Hypertrophic acne, in which the skin is thickened and rough, with red and purplish knobs, greasy and shining, is an aggravated form of this variety.

In acne simplex, as generally met with, it will be observed, on examining the surface carefully with a good lens, that in some of the spots inflammation has occurred round the orifices of the sebaceous ducts, on the apices of which are seated small brownish adherent crusts. At these places the hair-sac appears to have been torn out by scratching, or to be imbedded in the crust. In others, where this process has not gone so far, we only see the firmly-occluded hair-sac with its blackened orifice. I have never seen a hair issuing from one of these sacs. As very often no sebaceous matter can be squeezed out of these places, I am disposed to think that the irritation set up is not due to the imprisonment of the sebaceous matter, but to a morbid action in the hair-sac itself.

Acne is one of those diseases which demonstrate the inherent weakness of any classification. Although it is in one form—acne simplex—essentially a pustular disease, and frequently so in another variety—acne rosacea; yet suppuration, rare in the latter, is sometimes unknown through the whole duration of a case of the punctate variety. This is, however, no more than we find in other groups. Ecthyma is at times a vesicular disease; at others, it forms by a process very closely allied to that seen in disorders called sometimes impetigo, and, again, impetiginoid eczema. Further illustrations of this unsatisfactory state may be found in the separation of smallpox from the vesiculæ, though, so far as I can see, it is as essentially vesicular as herpes; and in the connexion of tinea circinata and pityriasis, which may pass into eczema with tinea tonsurans and pityriasis versicolor, which do not undergo this change.

Treatment.—The slighter cases of acne, and of the disorder known as steorrhœa, require little more than using no soap, and washing in hot water. If somewhat more severe, the spots may be bathed freely with a weak goulard or bismuth lotion.

But more advanced cases naturally require more energetic measures; and in order to make perfectly clear what I have to say, I propose to divide the treatment into four stages, embracing four groups of remedies. These are:—1. Preparatory treatment, especially called for when the tongue is foul, the appetite bad, the health out of order, and the bowels constipated. 2. Treatment devoted to the restoration of the strength and nutrition. 3. A course of remedies directed towards the absorption of material deposited in the indurated parts. 4. Remedies calculated to act peculiarly on the skin.

1. The first set of symptoms requires, in my opinion, saline aperients, with or without bitters, according to circumstances. Sulphite of soda or magnesia, or the heavy calcined magnesia, may be given with nitrate of potass in mint water, or, when the appetite is bad, in some bitter aromatic infusion, as calumba or serpentaria. However slight may be the signs of improvement which follow the use of these medicines, I feel little hesitation in recommending their steady continuance along with some mild aperient pill. I am the more particular in saying this, because I believe that, in the treatment of skin diseases, the rock always ahead is the slow progress made at first, and that it is most necessary, when we have once traced out mentally the path to be taken, to keep rigidly to it, unless, indeed, some quite unforeseen contingency should arise. At the same time, it is to be quite understood that bad cases are rarely cured by such means, the principal value of which consists in clearing the way for further measures.

2. After salines and aperients I would advise a course of steel. Perhaps the compound aromatic steel mixture, or the tincture of the sesquichloride (Pharm. Lond.) are as good as any for this purpose, and a full dose of one of these—say half a drachm to a drachm of the tincture, or an ounce of the mixture—may be given two or three times daily for six or eight weeks. I have, in some instances, both in these forms and in acne rosacea, observed that the sulphate of iron agrees better than the tincture, and in women of middle or mature age I have

seen it effect a rapid improvement, especially in rosacea, after iodide of potassium, liquor potassæ, Donovan's solution, tonics, and aperients had been tried in vain. If any constipation arise from the use of iron, an aperient may be given. For this to be effectual, three ingredients should be present. First, aloes in the form of aloin, or some preparation which will not irritate the lower part of the great gut; secondly, a minute quantity of mercury, so as to act gently on the liver; and, thirdly, a powerful aromatic, such as myrrh, sagapenum, or assafœtida; an aperient extract or pill may generally be added with advantage. Dr. Fraser says that when emmenagogues are required, the oil of savin in doses of one drop three times a day is a very valuable remedy in this eruption.

3. But in cases where there is no particular weakness or unhealthy state of the system, no chlorosis or defective menstruation, where dyspepsia or acidity of the stomach prevails, where steel induces acidity, headache, giddiness, and pain in the bowels, and when the acne is not benefited by the foregoing medicines, I think it will generally be found that an alkali is more suited to the case. Perhaps it would be difficult to select a better preparation than liquor potassæ in doses of thirty to forty minims twice a day in a tumbler of milk. The bicarbonate of potass has been recommended for this purpose in punctiform acne. Dr. Hillier used to give the liquor in combination with hydrocyanic acid and a vegetable bitter. As an aperient, calcined magnesia may be prescribed along with the potass; about half a teaspoonful to a teaspoonful of the heavy calcined is generally enough; it also may be taken in milk before breakfast. Generally it acts more satisfactorily if preceded by an aperient pill overnight.

4. The probability, however, is, that after effecting a certain amount of improvement, the foregoing remedies will cease to exert any control over the disorder. So soon as ever this becomes manifest, I would advise that arsenic in the form of Fowler's solution, without the spirit of lavender, should be added to the liquor potassæ. I have found the combination extremely beneficial in scores of cases. A young person of eighteen or nineteen, or an adult may begin with thirty-minim doses of the potass and five minim of the liquor arsenicalis three times a day, taking them in milk and immediately after meals. Younger and delicate persons should try smaller doses. After a time the quantity of arsenic should be increased, but acne seldom seems to require larger doses of this drug. So soon as decided improvement sets in, the potass may be given up and the arsenic alone continued. While giving either, however, five grains of the compound calomel pill may be advantageously prescribed occasionally at bedtime. When expense is no object, the arsenic may be taken in compound decoction of sarsaparilla; but to have any effect, the dose must be quite an ounce to two ounces, and the decoction must be good. I have had ample opportunities of satisfying myself that what is constantly sold as some unfailing preparation of sarsaparilla, exerts no control over acne, and most probably contains little more than a mere flavouring of this drug. It is no uncommon thing for hospital patients, especially for those whose material interests are likely to be seriously affected by the presence of such a disease—as in the case of men-servants, for instance—to spend almost their last shilling on sarsaparilla before applying at a public institution for relief, and that without deriving any benefit whatever.

Mr. Hunt seems to think time and money are simply wasted in trying any remedy except arsenic. I have given his plan a fair trial, and feel no hesitation in recommending as superior, that which I have laid down. My experience is that the patient bears arsenic always as well, and generally a great deal better, after a preleminary course of salines, acids, steel, and potass. Besides, arsenic will not set right a coated tongue, loss of appetite, sluggish liver, &c., symptoms of which many persons, as previously observed, complain at the outset.

Some writers have thought very highly of acids (as the great basis of treatment, I mean), sulphur, and antimony, in acne. The two latter I tried pretty extensively at one time, but they appeared to me inert. Possibly, taken in some warm drink on going to bed, they will bring on perspiration, and thus achieve a certain amount of success in the minds of those who think there is some mysterious connexion between the suppression of this function and the breaking out of acne. Tar and charcoal, taken together in the form of pills, seem, according to a communication made to me by Mr. John Wetherfield, to have answered very well in acne punctata. The most extraordinary success, however, that I have yet heard of occurred in the practice of M. Gübler, from the use of glycerine. He gave two dessertspoonfuls daily in acne punctata (acne simplex), and the pustules began to diminish in number and volume "from the day that the remedy was first taken."

I need scarcely say that numberless external remedies have been recommended in acne. I have no doubt that the accounts of the success, said to have been attained by the use of these are all in good faith; but, at the same time, I feel bound to say that my own observations have led me to conclusions very unfavourable as to their efficacy; indeed, I am disposed to believe that few local remedies possess any power over this disease, and that the control exerted by those is limited and uncertain. The best of these seem to be preparations of chlorine and iodine, with sulphur or mercury as a base. It will be found that they all possess a certain amount of epispastic power; and it is probably to this that they owe their beneficial action, it being, so far as I can see my way, very doubtful whether they, one and all, equal a blister in efficacy. Foremost among these preparations stands the hypochloride of sulphur, with which the surgeon may begin at once. At one time I used to prelude the employment of it by ordering, first of all, the ointment of the subchloride of mercury, and then of the ammonio-chloride, but after watching their effects in a great number of cases, I have come to the belief that the former, though recommended for skin diseases generally by so high an authority as the late Dr. Pereira, is almost, if not quite, useless in acne, and the ointment of ammoniated mercury not very reliable.

The ointment of the hypochloride should be smeared pretty thickly on the spots at bedtime, and allowed to remain on all night. In the morning it may be washed off with very hot water and pure soap. When the patient can afford it, glycerine should be added to the water. In some cases a weak lotion of bismuth or borax does good, and as both are harmless, both may be tried. I know of no rule to discriminate at the outset those cases in which they are likely to succeed.

When the hypochloride begins to lose its effect, biniodide of mercury ointment—15 or 20 grains of the salt to an ounce of lard—may be substituted. A very small quantity should be worked into each spot with the point of a butcher's skewer or an ivory stilet. If there be any large very indurated spots, it is a good plan to pierce them with a trochar not thicker than a stout sewing-needle. The bleeding spots should be well bathed with hot water. This is easily done by means of a flannel pad and a small mandril. The pad is dipped in almost boiling water, shaken, and pressed against the spots. A blister acts still more efficaciously in clearing the way for the iodide; but then it is almost impossible to get patients to blister. I have not succeeded in doing so more than three or four times. When the patient can manage to take them, I always recommend a course of vapour baths towards the close of treatment.

Rosacea may be fairly cited as one of the diseases which most strikingly point out the great improvement made of late years in the treatment of cutaneous affections. It is not so long since Bateman's time, yet then rosacea was universally thought incurable. Bateman himself maintained that a perfect cure could seldom be accomplished, and this belief is still only too prevalent. M. Bazin, writing in 1860, says that the arthritic form (couperose arthritique), "est très tenace, et fait le désespoir du malade et du médecin." Yet rosacea is not so unmanageable. In general it is much more curable than acne; and it may be safely said that the difficulty lies rather with the patient than with the complaint. Indeed, I believe there are few severe diseases of the skin in which the progress of treatment can be more accurately calculated, and a favourable prognosis given with greater confidence, than rosacea.

The treatment need not differ from that pointed out for the other varieties, except that in rosacea it is often quite unnecessary to give more than the salines and a short course of steel or alkalies. Arsenic is rarely called for. The external treatment is in every way identical.

Suppose the medical attendant has tried all these means in an obstinate case of acne, are there any others on which he can rely? I am afraid the question must be answered dubiously; there are, no doubt, remedies enough; but when we scrutinize the proofs on which their reputation is based, we find little to encourage us in the belief that they possess any power of curing the disease superior to that of the remedies already mentioned.—*Edinburgh Medical Journal, July*, 1872, *p*. 27.

71.—THE TREATMENT OF ULCERS OF THE LEG.

[The Editor of the *British Medical Journal* gives a report on the mode of treating ulcers of the leg at some of the principal hospitals in London. Mr. Barnard Holt's plan of treatment, at the Westminster Hospital, appears to us the most deserving of notice. At nearly all the other hospitals skin-grafting is the treatment adopted.]

Mr. **Barnard Holt**'s treatment for ulcers of the leg consists in an endeavour, by proper position, attention to the general health, and suitable dressings, to procure a moderately healthy granulating surface, taking care to remove with the knife all hypertrophied cuticle in the margin of the ulcer. Having done this, provided the ulcer is not very extensive, he invariably hermetically seals the wound by the application of oiled silk, collodion, and strapping in the following manner. A square piece of soap strapping two inches larger than the outer circumference of the ulcer, having a hole made of the exact shape of the ulcer, is applied upon the leg. Upon the strapping good collodion is applied with a brush, and over ulcer and strapping one square piece of oiled silk is laid. This at once seals the ulcer; and, in order to prevent the edges of the oiled silk from rubbing up, he further fastens them down with small strips of plaster. If the discharge be profuse the sealing will require to be repeated in a couple of days, but the intervals of removal are quickly prolonged, inasmuch as the exclusion of air limits the discharge and facilitates the formation of the skin from the edge of the ulcer. No other application is required, and the ulcer speedily heals. Mr. Holt never destroys exuberant granulations by sulphate of copper or other caustics, as the encroaching skin speedily produces their absorption, and the application of caustics destroys the fine filamentous cuticle that is to close the ulcer. He has employed this method of treatment for years with the most satisfactory results. Of course, these observations only apply to ulcers that are not the result of any specific poison.—*British Medical Journal, June* 15, 1872, *p*. 642.

72.—REMOVAL OF CORNS.

Hard corns may be carefully picked out by the aid of a small sharp-pointed scalpel or tenotomy knife, and if well done the cure is often radical, always perfect for the time. But they may be equally successfully removed by wearing over them for a few days a small plaster made by melting a piece of stick diachylon (emplastrum plumbi), and dropping it on a piece of white silk. The corn gradually loosens from the subjacent healthy skin, and can be readily pulled or picked out. Soft corns require the use of astringents, such as alum dissolved in white of egg, or the careful application of tincture of iodine. Prevention, however, is in regard to them better than cure, and can be readily attained by daily friction with cold water between the toes.—*Edinburgh Medical Journal, June*, 1872, *p*. 1136.

73.—INGROWING NAIL.

By **Benjamin Blower**, Esq., Liverpool.

I desire to add a mite to the evidence repeatedly given in the Journal, that the removal of the nail (to my knowledge not always successful,) is unnecessary.

About twenty years ago, I applied a bit of compressed sponge to afford temporary relief, and was delighted to find that it effected a radical cure. I make the sponge as solid as leather, by wetting and then winding string very tightly round it, and drying it thoroughly. Of this I cut a small pyramidal piece, less than a grain of rice. This I insert beneath the nail, and secure it by strips of adhesive plaster, applied longitudinally, to avoid compression. The sponge soon becomes moist and swollen, keeping the nail from the irritated flesh. Any granulations should previously be destroyed with strong nitric acid. I have adopted this plan upon many occasions, and have never found it to fail.—*Brit. Med. Journal, Sept.* 21, 1872, *p.* 327.

SYPHILITIC AFFECTIONS.

74.—ON SYPHILIS.

By M Ricord, Paris.

[The following is an epitome of M. Ricord's speech before the Surgical Section of the British Medical Association, when requested to explain his views on that subject, at the conclusion of a paper by Mr. Acton.]

There was one great question in regard to syphilis, and it was this: could it be cured radically? In former times, all venereal affections, no matter what, were considered as belonging to syphilis, and certainly there was then an immense number of radical cures by mercury or any other means. In this way swellings of the glands, soft chancres, even warts, and other things not belonging to syphilis, were easily enough cured; radically cured; and there were no after-consequences, no secondary symptoms. This explanation would account for the immensely large number of cases of (reputed) syphilis which used to be radically cured. But, since syphilis had been correctly diagnosed, the inquiry to which he had devoted a large part of his life was to see what belonged to syphilis, and what resembled it without belonging to it. There had been great differences in the results of treatment—so much so that a doubt, as Mr. Acton had said, had arisen whether real syphilis could be cured. That doubt as to the curability of syphilis was not recent; it was a doubt which old authors had expressed; and one particularly, with a curious name, which they would probably remember—"Mercurialis"—thought that now and then an armistice might probably be made with syphilis, but that there was no real cure. In fact, they frequently saw that a long time—months, years—after the symptoms had been treated, new symptoms appeared. And so the doubt whether syphilis could be radically cured, or whether the cure was only temporary, with a prospect of the symptoms returning, might still remain; he, (Ricord) however, had established the law of the unicity of the diathesis of syphilis. The law of syphilis was the same as the law of small-pox, cow-pox, or measles. A man could have but one attack so long as the disease remained in the constitution—that was to say, according to his opinion, a new attack could not take place while the system was still under the influence of the old diathesis. Well, it was exactly so with syphilis; as long as a patient was labouring under the diathesis of syphilis, another *infection* of syphilis could not occur—it was impossible. For instance, after indurated chancre, and the appearance of secondary symptoms, it was not possible for the patient to contract a new indurated chancre, with swelling of the glands, manifestation of skin disease, and so on. After one attack the patient could not have another infection as long as the influence of the first remained in his body; a second contagion could not take possession of the system at the same time. If, perchance, something of the kind took place, the symptoms would not follow the regular evolution. So, when a patient had constitutional syphilis, if a new chancre appeared to be hardened, they would not find the glands swell, or the early manifestation of skin disease appear; and so of other symptoms. Superficial ulceration might take place, just as a spurious form of vaccination might arise on one who was still under the vaccine influence; but it was not a true case, it was not attended with the sequelæ. But if the constitutional disease were cured, if the syphilitic disposition were completely eradicated, then the patient would be able to contract a fresh indurated chancre, with all the subsequent symptoms. If this were the case—and he had observed it with great care, his experience dating back forty years—it proved that syphilis could be cured; and if syphilis could be eradicated, to ascertain whether a patient was cured or not when all the symptoms had disappeared, there would be nothing else to do (though he knew that could not be done) but to try inoculation from an indurated chancre. If vaccination did not take, they were sure the vaccine disposition continued; if it did not continue, vaccination could take effect. In regard to syphilis, the proof had not been carried to this extent; but he had been able to observe that as long as the syphilitic influence continued, a patient could not contract an indurated chancre anew, and that, consequently, if cured, a new infection might take place. This was a great point gained in science, and it proved what he had said, that syphilis could be radically cured. Now, as to the treatment of the disease. As he had told them, Mr. Acton's ideas were completely his ideas, explaining his manner of treatment and his practice. He would first speak of the treatment of the first stage—that was to say, the primary sore. As soon as he had ascertained that there was a hardened chancre, with a swelling of the glands—not inflammatory, because the glands in this case never suppurated—he immediately instituted the mercurial treatment. There was one point on which there was some difference of opinion; many believed that it was impossible to prevent the accession of the secondary symptoms, the first manifestation of constitutional disease; many thought that no matter what treatment was employed, the sequelæ would appear. Well, he had ascertained that if the treatment were soon begun and well carried through, the bursting out of the first secondary symptoms, the roseola, the swelling of the glands of the neck, etc., might be prevented. If this were not frequently the case it was because the treatment was resorted to too late, when the disease had had time to take root, and secondary symptoms were about to show themselves. In such cases it was not astonishing that secondary symptoms should appear, and the treatment ought not to be blamed; if the treatment were steadily continued they soon disappeared. But if the treatment were begun early, the observation of forty years gave him the assurance that secondary symptoms would not appear. When secondary symptoms had appeared, the best treatment was, as Mr. Acton had said, mercury. If they wished for a perfect cure, this treatment must be continued. In general it was not persisted in long enough; it was dropped as soon as the symptoms disappeared, or a short time after, and then it was not astonishing to see them re-appear. But if the treatment were continued five or six months, having regard at the same time to sustaining the constitution in general, relapses would be found to be infrequent. He observed very few cases of relapse, and there would not be many when the treatment was well kept up—when the patient had patience enough, and the physician sufficient courage. After six months of that treatment and no symptoms reappearing, then the treatment with iodine must be begun, and continued for five or six months more. When a patient went to him, he said, "You will have a year's treatment—do you consent to that?" "Yes." "Very well; we shall go on. If not, good-bye." There were cases in which syphilis occurred in a healthy person—the only disease was syphilis. Then treatment was very easy;—the case was a simple one; they had but one enemy to fight—all went on regularly. But, unhappily, in many instances syphilis was not alone; there was something else—scrofula, skin disease, scurvy, low constitution, poorness of the blood. They must understand that such complications as these altered the case; the treatment did not act so powerfully as it would do in the first case, as many of these complications were aggravated by the treatment. For instance, syphilis and scurvy might co-exist—and the characteristic of the latter was poorness of the blood, while that of the former was a plastic condition of the blood. Here, therefore, was a counteracting influence to the treatment of syphilis. Now, one thing must be known. In many instances syphilis became the secondary consideration, and they must begin with the constitution of the patient, as debility was the disease that required first treatment. They must attack the strongest enemy first. Syphilis was sometimes quiet, and stopped and waited till they came to it. So, when they had improved the constitution, they might commence with the treatment, and they must begin by treating the constitutional complication. The best treatment was the protoioduret of mercury. The stomach bore this well in general. Sometimes it gave rise to a little diarrhœa, which was an easy thing to moderate; but when the stomach was not tolerant of the remedy, one capital treatment was that which Mr. Acton had told them he had confidence in—namely, rubbing-in. If this were not an unpleasant and disagreeable operation, certainly it would be in general about the best; he himself should prefer it. In rubbing-in, the action of the remedy was powerful and quick, and the stomach was not at all troubled with it. If it were not so disagreeable, and were a thing that could be done without being noticed, he should give it the preference. However, there were cases in which the skin was otherwise affected, in which there was a skin disease, and then friction could not be used. In a case of complication of syphilis and herpes, rubbing-in could not be resorted to. In general, patients bore the iodide of potassium well, and in large doses. For his own part he frequently employed forty, sixty, eighty, even a hundred grains a day, and more. They must bear in mind that if they gave too small doses to some patients they would have no result; it was a remedy that passed through the body with great rapidity. He had had great experience of it, and he had found that in half an hour it had passed away in the urine. Iodide of potassium was a sort of broom of the blood. So they saw that the methodical treatment was this: mercury, iodide of potassium. But only one for the first stage, and only the other for the later stage of syphilis? No, the rule was absolute that as long as there were secondary symptoms well marked, mercury must be given; when there was a mixture of secondary and tertiary symptoms, mercury and iodide; for tertiary symptoms, iodide. To treat some patients with iodide would not advance them in any way. Why? Because there was frequently in the constitution, in the blood, something of the second stage, something that required the mercurial treatment. This might not show itself, but when iodide of potassium ceased to do good, the disease remaining stationary, let them go back to mercury again, and they would have a splendid result where they had thought there was no further possibility of curing the patient. This was what Mr. Acton had said, and he was completely and absolutely of Mr. Acton's opinion. But there was another thing. When syphilis had lasted for a long time, and had had a great effect on the constitution, it in some way disappeared, and left the patient with a complication existing that was not existing before. Sometimes a long course of treatment brought on a new disease—wasting of the constitution, poorness of blood. They must then stop all the specific treatment, and applying themselves to the principal symptom, restore the constitution by preparations of iron, bark, tonics, and proper food, so bringing the patient back to the possibility of undergoing anew a regular methodical treatment, either by mercury or iodide, or a combination of these two remedies. In former times, when a person was thought to be syphilitic, physicians seemed unable to entertain any other idea than that of syphilis, and acted exclusively against a specific disease, neglected everything else, and in that way they experienced all the bad effects and accidental symptoms which a bad administration of the symptoms would produce. Mr. Acton had spoken of the use of bromide of potassium. His views were exactly the same as Mr. Acton's with respect to the use of the remedies at different stages, the necessity of having regard to the complications that might exist, and of dropping the treatment for a while till the constitution was restored. This was regular and methodical, and his own manner of practice. But now, was bromide of potassium an anti-syphilitic remedy? He did not believe that it was. He might be mistaken; but he had experimented with it in syphilitic symptoms, and without any apparent result. But it was a splendid remedy in complications of syphilis. In some cases of symptoms referable to the nervous centres, bromide of potassium was an adjunct, and came to the help of mercury or the treatment by iodine. In some cases of brain disease with syphilis, and of disease of the spine or epilepsy, bromide of potassium did wonders. So that they would see it was a remedy to be applied in nervous complications that might occur, but they must not depend on it as an anti-syphilitic remedy. Now, there were symptoms following syphilis which were not syphilitic, and these must not be treated with mercury or iodide of potassium. For instance, there might be necrosis. Well, they could not bring a dead bone back to life, no matter what quantity of mercury or iodide of potassium they might give. A physician must know these things, and he (M. Ricord) ought almost to apologise for bringing them forward. It should be observed that specific remedies did not always act specifically. Certainly, there was no specific effect without a specific cause, but specific causes did not always act specifically. So there were some effects of syphilis, such as disease of the bones, that would afterwards act as a common irritant. In syphilis there might be an ulcerated bone in the nose or mouth, bringing on suppuration; mercury or potassium would not remove that, but let the diseased bone be removed, and the patient was frequently cured. They must take note of all these conditions—the nature of syphilis, the manner in which it conducted itself, its action on the constitution. Let them particularly take note that the general law of syphilis was the same as the general law of small-pox, vaccine, and measles. If they were sure of this from what he had said and from their own experience, then they might be sure that syphilis could be perfectly, radically cured. They could tell their patients that, and give them courage and hope. If the patient had courage to go through with the treatment, and the physician had courage enough to stick to it, the patient might be radically cured. He thanked them for the reception they had given him; it reminded him a little of his hospital in Paris.

A question was asked whether Dr. Ricord was a believer in salivation.

Dr. Ricord replied—No, surely not. Salivation was an accident following the treatment, and it must be avoided as much as possible. There was but one case in which he approved of salivation, and that was in disease of the eye—iritis. When this occurred, and salivation was brought on, the inflammation of the iris subsided.—*Lancet, Aug.* 17, 1872, *p.* 228.

MIDWIFERY,

AND THE DISEASES OF WOMEN AND CHILDREN.

75.—A NEW USE OF BARNES'S DILATORS.

By Dr. HERBERT M. MORGAN, Lichfield.

As I have on two occasions lately found Barnes's dilating bags of great service in what I believe to be a new way of using them, I shall be glad if publicity can be given to the following narratives, as it may be the means of helping others in similar cases.

Case 1.—A woman, who had had a tedious labour as a primipara, was taken in labour with her second child, and the "waters broke" very early. I found the pains moderately good, but the os small and unyielding. The natural and elastic dilator of the os—viz., the bag of waters—had gone; and here was a case which in the ordinary way would be very tedious to the patient and her attendants. I thought that, if I could make an artificial bag of waters, so as to imitate nature, I should materially assist the labour; so, with great difficulty, I managed to introduce Barnes's largest bag within the os by the help of an uterine sound. When once it was there, it was easy to pump in nearly a pint of warm water; and I was much gratified to find that the labour then progressed very well, each pain dilating the os by means of the artificial bag quite in a natural way. I am sure that by this means I gained some hours, which would have been lost in useless pain but for the bag.

Case 2.—A farmer's wife had a miscarriage at about the eighth month of her fourth pregnancy. This was followed by a discharge of more or less blood for about a week, when suddenly she had such a copious loss as to make her quite faint. She then first sent for me, and I found her with a blanched face and constant sickness. The os was dilated to the size of a florin, and not yielding; the membranes were entire; and I could detect that it was a case of placenta prævia, with the cord attached just inside the os. I ruptured the membranes with a stilette; and then, by means of a long pair of ovum-forceps, I passed Barnes's largest bag (rolled up small) quite into the womb; and afterwards pumped into the bag nearly a pint of warm water. As she had no pain worth mentioning, I had given her forty minims of liquid extract of ergot before puncturing the membranes. As soon as I had filled the bag with water, I commenced dilating the os myself by drawing at the tube of the bag till my finger and thumb could reach the root of the tube in the vagina. If I had pulled at the tube, it would have stretched, rather than allow the bag to dilate the os; so I took hold of it just where it joins the bag (which will be noticed as being the strongest part), and kept steadily pulling at it. The result was that, in a little more than five minutes, I pulled a soft bag, as large as an ordinary new-born child's head, through the os; and then the vagina and perinæum were gradually dilated in the same way until the bag came quite away. I found the head presenting, and pains were coming on moderately; but, as there was no time to be lost, I preferred not to wait for nature to act; so, with one hand internally, and the other externally, I turned the child and brought a foot down, and soon completed the labour with the aid of the patient's own pains and efforts. The placenta was expelled naturally, and the womb contracted well after it.

Now for the advantages of this mode. When I arrived, I found the os so unyielding, that I feel sure that the ordinary mode of dilating by the hand, in form of a cone passed into the vagina, would have been a very doubtful process. It might have failed from cramping of the hand in the attempt; or, worse still, the os might have given way, and the uterus been ruptured. Any way, dilatation could not possibly have been accomplished so quickly, so easily, so painlessly, and so safely, by the hand. Moreover, this bag, by being pressed against the bleeding placental vessels in its passage through the os, compressed them and checked the hemorrhage, in the same way as the head does in these cases where the pains are strong enough to keep it well pressed against the os.

I may mention in passing, that, before using the bags, it is well to try how many syringes full of air are wanted to bring them to the required size. This is a great help, as they cannot be seen when in use.

I am not aware that this method of making a new bag of waters has been published before; but I have no wish to claim priority, if any one have already written about it. I shall be quite content with adding a little extra testimony to its value.—*British Medical Journal, May* 18, 1872, *p.* 523.

[We may mention that, at the meeting at Birmingham of the British Medical Association, Dr. Morgan showed us an improvement on Barnes's dilators, for the purpose named in this article. The bag now recommended by him is pear-shaped, and considerably larger and stronger than Barnes's largest sized dilator. An unyielding material was also inserted at the junction of the tube, in the substance of the india-rubber, and this material extended a little upwards on the ball and several inches down the tube. The object of this is to strengthen the point of junction, and the upper portion of the tube, in order that traction may be made upon the base by means of the tube. This is a great advantage, as the dilatation of the os can thus be much facilitated owing to the shape of the india-rubber ball. We consider this improvement of Dr. Morgan's one of great value. The dilator was made by Weiss.—Eds.]

76.—ON THE EXTERNAL AND INTERNAL ORIFICES OF THE UTERUS: THEIR ANATOMY, PHYSIOLOGY, AND PATHOLOGY.

By Dr. J. Henry Bennet, late Obstetric Physician to the Royal Free Hospital.

Anatomically, there are two distinct cavities in the uterus; that of the body, the larger one; that of the cervix, the smaller one. It is in the cavity of the body of the uterus that conception and the development of the fœtus take place, whilst the cavity of the cervix is a species of ante-chamber which precedes and protects the more sacred internal precincts. The circular fibres of the body of the uterus converge towards the cervix, are continued throughout its entire extent, and form the greater part of its tissue, half an inch in thickness. These circular fibres of the cervix are endowed with vitality, and with contractility in the cervical canal, even in the non-pregnant state, as is seen on introducing a stick of nitrate of silver, or a solution of nitrate of silver, into the cervical cavity. Its entire extent instantly contracts, so that the uterine sound can no longer be introduced without an effort, although the canal may have been quite patulous before. These circular fibres, in the healthy uterus, surround and form an infundibuliform cavity in the central cervical region; whilst at the outer or vaginal outlet, and also where the cervix passes into the uterine cavity, they are in circular approximation, like the sphincter ani. They thus close the canal in both directions, and resist the effort to enter either cavity with sound or bougie, and that by a vital contraction. In a word, the cavity of the uterus is separated from the cavity of the cervix by a regular sphincter, a fact which I was the first to demonstrate in 1848; and the cavity of the cervical canal is separated from the vagina by a second sphincter. I do not mean to assert that on dissection a separate band of muscular fibres, assuming the form of a sphincter, can be demonstrated, nor have I ever made such a statement. What I have asserted and do assert is, that the circular fibres which constitute the mass of the thick structure of the cervix uteri, or some of them, contract vitally and perform the functions of sphincters. I would remark that, anatomically, all the great cavities of the body have sphincters—the stomach, the intestinal canal, the bladder. For the uterus not to have one, would be an exception to this anatomical rule.

Physiologically, these sphincters open and close under physiological conditions. Before, during, and after menstruation, the os internum often opens to gentle pressure in cases in which it is impassable, except to force, in the interval of menstruation. In a much minor degree I notice the same fact with the healthy os externum. In all probability they both open, likewise, under the influence of sexual orgasm, thus facilitating the entrance of semen and conception.

On the other hand, the os internum constantly closes spasmodically on the contact of the cold uterine sound, so as to require more or less force for it to pass, and that in the healthiest female. A warm wax bougie of the same size will, however, often pass with gentle continued pressure. The contact of any astringent or irritating substance—alum, zinc, tannin, nitrate of silver—occasions, in a few seconds, such a contraction of the os externum as to effectually close the canal. Closure of the uterine orifices, indeed, is so much the rule in the healthy female, that an open patulous condition of either orifice may be considered to generally imply disease, inflammation, inflammatory hypertrophy, or a fibrous growth.

To me it appears that the above statements are facts, undeniable, uncontrovertible facts; and if so, it is of the most vital importance that they should be generally recognised. In actual practice, we constantly hear of serious operations performed on the uterus by eminent obstetricians or surgeons, founded on the non-recognition of these anatomical and physiological data. Such operations are based on the supposed existence of strictures, which, if I am anatomically right, often do not exist. A remarkable fact connected with the operations the abuse of which I criticise is, that one class of eminent practitioners, such as Sir James Simpson and Dr. Greenhalgh, very frequently divide the os uteri internum as the seat of stricture, and as the cause of uterine suffering of all kinds; whereas other practitioners equally eminent, Dr. Marion Sims and Dr. Emmet, for instance, I believe, think that the os internum proper is seldom in fault, and divide the os externum down to its vaginal attachments in all but exactly the same class of cases. Thus, the practice of each category stands condemned by that of the other.

The division of the os uteri internum for sterility, dysmenorrhœa, &c., was introduced by the late Sir James Simpson more than a quarter of a century ago, and I do not think that, up to the end of his career, he ever discriminated between physiological and morbid contraction of the os internum; or, in other words, that he ever adopted the above view long ago submitted by me to the profession. I certainly have known him, in consultation, declare females to be suffering from stricture, when they presented what I considered to be a mere physiological resistance to the introduction of the sound. Moreover, I have seen many females in whom he had clearly divided the os internum under the same conditions. Indeed, it is well known that the division of the os internum had become a matter of routine with our lamented colleague. I may add that it is so still with many of his followers at home and abroad. Thus, in 1864, Dr. Greenhalgh stated, in my presence, at the Obstetrical Society, that he had divided the os internum in several hundred cases within a few years.

Dr. Marion Sims, on the other hand, in his really valuable work on the *Surgery of Women's Diseases*, seems to think that the os uteri internum can generally be left to take care of itself, and proposes as a remedy for sterility, displacements, and chronic inflammations of the uterus, division of the entire cervical wall on both sides, down to its attachments to the vagina. In midwifery, we are taught to consider laceration of the cervix, during labour, down to its vaginal attachments, a serious complication, and I constantly find it the evident cause and origin of severe chronic inflammatory disease. Yet it is this condition, artificially induced—it is this surgical interference with the natural structure of the uterine neck—that is to remedy sterility, to remove secondary displacements, and to cure chronic inflammatory disease. For myself, I believe that this operation is totally powerless, as a rule, to remedy or even palliate these conditions. Dr. Sims says that he and his colleague, Dr. Emmet, have performed this operation more than five hundred times within a few years in their hospital at New York, and with satisfactory results; but these women should have been seen a year after the operation. No results obtained by uterine treatment of any kind can be accepted as permanent until after that lapse of time.

It must not, however, be thought that I deny congenital or pathological stricture of the uterine-orifices. Far from it, I have myself in many cases cured severe congenital dysmenorrhœa by dilatation of the os internum. But I was not guided in having recourse to such treatment, by the resistance of the os internum to the sound, an unreliable guide, as we have seen. I have resorted to it in congenital cases because there was no other apparent cause for dysmenorrhœa, but evident narrowness of the passages: in pseudo-membranous dysmenorrhœa, to give a freer exit to the pseudo-membranes; in pathological cases, in chronic inflammatory disease, because the removal of the morbid condition was not followed by spontaneous dilatation of the really narrowed orifice, and by disappearance of the dysmenorrhœa.

As to division of the os externum, I should feel disposed to limit it to those exceptional cases of conoid cervix in nulliparous women, which my friend Dr. Barnes has well described, and in which the orifice of the os internum is preternaturally small. With some women, its rational aggrandisement may certainly facilitate menstruation and conception. But I do not consider it a rational surgical procedure to dilate the cervix, by cutting it in two from apex to base. What surgeon has ever proposed to dilate stricture of the male urethra by dividing the glans or entire penis in two halves?

In conclusion, I would recapitulate, by stating that I myself do not consider that there is any positive evidence of abnormal contraction of the os uteri internum if a small wax bougie, warmed and bent to the natural anterior curve of the uterus, passes, on gentle continued pressure, into the uterine cavity. I do not even consider that there is any such evidence on the non-passage of the uterine sound or of the small wax bougie. If there be no dysmenorrhœa, if free painless menstruation exist, the contraction may be vital; it may, and probably does in such cases, relax physiologically at proper times and seasons.

As to the os externum, I see no reason for surgical interference if a good sized wax bougie can be passed easily into the cervical canal. I must confess to being utterly unable to understand how dividing the structures of the cervix, how artificially producing an obstetrical laceration of the organ, can cure these varied diseases. In my opinion the operation, as a routine operation, is a surgical error, and yet it continues to be the routine practice of many eminent obstetricians, and that without the data on which it is founded being given.—*British Medical Journal, Sep.* 21, 1872, *p.* 821.

77.—ERGOT IN ABORTION.

By Alfred Freer, Esq., Stourbridge.

In a discussion at the late meeting of the British Medical Association, Dr. Fvory Kennedy remarked that, "in abortion, ergot was generally inadvisable." As abortion about the tenth or twelfth week is frequently met with in general practice, it is, I think, important that the question of the utility or uselessness of ergot in cases of this kind should be freely ventilated. I have given the drug in above two hundred cases of profuse hemorrhage with threatened abortion, and with the happiest result. Only yesterday, I attended a woman at the full time with a healthy boy. On February 10th, twenty-five weeks ago, she was taken with great flooding and alarming faintness. She was in the third month of pregnancy, having been "unwell" last in November. I plugged at once with a handkerchief, not being quite able to bring away the ovum, which was protruding to a great extent at the cervix. I then gave doses of the ammoniated tincture of ergot every hour. All bleeding ceased, and the patient went on perfectly well to her full time. I am engaged to attend a lady in October who had precisely the same symptoms in the Spring. Indeed, I can call to mind several instances where, ergot being given to check uterine hemorrhage, it has acted well by causing, not the expulsion of the ovum, but its gradual retrocession into the uterus. From what I have seen of the use of the remedy, I am prepared to maintain that it is a most valuable help; but that not unfrequently it does good, not by forcing the contracting uterus to expel its contents, but often, contrary to our expectations, by helping the organ to retain its precious charge to its ultimate preservation. Ergot, in my opinion, is, in threatened abortion, only second to a plug in the vagina; and the best plug I find is a piece of sponge.—*British Med. Journal, Sept.* 21, 1872, *p.* 327.

78.—PERINEAL LACERATIONS.

By Dr. Joseph G. Swayne, Physician-Accoucheur to the Bristol General Hospital.

Of all the accidents attending delivery, there is none more common than partial, and none more rare than complete, laceration of the perineum. By partial laceration I mean a rupture extending beyond the fourchette without passing through the sphincter ani muscle; and I do not apply the term to that simple rupture of the fourchette which almost invariably takes place in a first labour. My observations now will be limited to these partial lacerations; and to show how common they are, I shall refer to my notes of the last 400 labours which I have myself attended. In all of these the condition of the perineum after delivery was carefully observed. The result is, that there was one case of complete laceration and 31 cases of partial, 25 of which occurred, as might naturally be expected, in primiparæ and six in multiparæ. Now, as there were 101 primiparæ in the 400 cases, it follows that, in about a quarter of these, partial laceration of the perineum took place. Such a result may at first appear startling; but I do not think it would surprise any one who is in the habit of making frequent examinations with the speculum; for it is remarkable how often one thus discovers the evidences of rather severe perineal laceration. Yet these occurrences, although so common, are very apt to be overlooked. "Out of sight, out of mind" is the general rule in such cases; partly because the practitioner, from regard for the natural feelings of delicacy of his patient, is unwilling to expose the parts to view, and so does not see the laceration either at the time of its occurrence or afterwards; and partly because these accidents cause no very urgent symptoms, and therefore the patient does not direct attention to them. But, although they give rise to no very grave or urgent symptoms, yet they occasion minor inconveniences of different kinds, which it is just as well to prevent if possible. For instance, it is very common to find women complaining of great soreness of the vulva for two or three weeks after delivery, and, on examination, a severe laceration of the perineum is discovered, which still continues in an unhealthy, irritable condition. When a sore of this kind heals after several dressings and applications of caustic, no union of the torn edges takes place, but the perineum still remains in an incomplete condition. The result is, that an uncomfortable feeling of want of support is left; the parts remain too open, and there is a predisposition to prolapse of the uterus and vaginal walls. Although these consequences are not very grave, yet they are of sufficient importance to merit attention and inquiry as to the best means of prevention and cure. With regard to the former, my own experience leads me to endorse all that has been brought forward by various authors, especially by Dr. Graily Hewitt, in proof of the inefficiency of support for the prevention of laceration of the perineum. I have supported the perineum in many cases where rupture appeared imminent, and in many others of a similar character I have left that part without support; and the result from both plans has appeared to be much the same. There is seldom any great danger of rupture, until the head is protruded so far that the accoucheur can grasp the exposed portion with his thumb and fingers. When this can be done, the best plan is to press the head forwards as much as possible under the pubic arch, so as to prevent the *vis a tergo* from acting so directly downwards upon the perineum. When there is any reason to apprehend laceration, it is always as well to have the part in view, so as to be able to give this kind of assistance at the right time; and if the patient be brought close to the edge of the bed, with the thighs well flexed upon the body, this may be managed with so little exposure that she is scarcely conscious of it. Besides, if laceration does occur, it is very difficult to estimate its nature and extent by the touch only, without having recourse to the sight; and that is the reason why many cases of ruptured perineum are overlooked, until it is too late to obtain union of the wound by the first intention.

When in attendance on primiparæ, I generally, if possible, thus see what is going on, so that I can observe the nature and degree of the rupture just at the time when it takes place, and be able to treat it without loss of time. I have thus seen that, when rupture takes place, the rent usually commences at the fourchette, and extends backwards; but I have almost as frequently noticed it to begin near the centre of the perineum, by two or three small lacerations, and extend forwards. These are generally the least favourable cases for union by the first intention. Almost the only case which I met with, in which the torn edges did not unite when brought together at once, was one of this description. The perineum was, as it were, perforated in two places just in front of the sphincter ani, and from each perforation a rent extended forwards, until the two lacerations met at the fourchette, so as to enclose between them an angular piece of flesh, which subsequently partly sloughed.

With respect to the predisposed causes of laceration of the perineum, one can readily understand why the accident should be common in primiparæ, especially in those in whom, from advancing age, that part has become unduly rigid; but the most frequent cause of all, especially in severe cases, is, according to my experience, an unusual breadth of the perineum. When this is the natural conformation of that part, it will be better, when treating the rupture, not to make any endeavours to produce union of the anterior part of the wound. If the accoucheur does his work too well in this respect, he will very likely have the mortification at a subsequent confinement of witnessing a good deal of it undone by a fresh laceration.

I once met with a curious case in which I found an undue breadth of the perineum in a woman whom I attended in her second confinement. Her first confinement was tolerably easy, and accompanied with very slight laceration of the perineum. Whether, during the healing process after this, adhesion of the lower edges of the labia majora took place, I cannot say; but I found, when examining during the second labour, that the perineum was of most unusual breadth. It for a long time resisted all the natural efforts, and became so tightly spread over the head that it appeared every moment in imminent danger of rupture, whilst the os externum still remained small and undilatable. On examining more carefully, I found a dimple-like depression some little distance from the anterior edge, which appeared to mark the proper situation of the fourchette. I accordingly divided the part in front of this on a director, and the head was born almost immediately without causing any rupture of the remaining portion.

Besides the causes above mentioned, the large size of the child's head and unfavourable presentations, especially those where the head is expelled with the forehead under the pubic arch, will predispose to perineal laceration. In most of the six multiparæ, in whom I noticed perineal laceration, there had been only one previous confinement, and the perineum had then escaped laceration in consequence of the small size of the first child. In the same way an unfavourable presentation in a subsequent labour may cause rupture in a woman who has escaped the accident at several previous ones.

The treatment of partial laceration of the perineum is, I think, most satisfactory, provided it be adopted immediately after the occurrence, or rather I should say, immediately after the termination of the third stage of labour. The best method of treatment is to bring the torn parts together by two or three sutures of fine silver wire. I have generally found that the wound healed more kindly with these than with silk ligatures. An old-fashioned semicircular needle is the best for the purpose. The needle should enter the skin about a quarter of an inch from the edge of the wound, and the sutures should pass through the tissues at about two-thirds of their depth. The operation gives but little pain, as the parts seem to be partially benumbed, and their sensibility impaired by the long continued pressure to which they have been subjected. The number of sutures should be in proportion to the extent of the injury. I have never used more than three; most usually two are sufficient, but in slight cases I have been content with one. As a general rule, when the perineum is not ruptured to half its extent, no treatment will be necessary. I generally remove the ligatures about six days after delivery. Dr. Graily Hewitt, however, removes them at the end of three days. I cannot help thinking that this time is too short, and that by removing them so soon we run a risk of separating the newly formed adhesions. I have never had cause to regret leaving them so long *in situ*; indeed, as I before remarked, cases treated in the way just mentioned terminate most satisfactorily, and I scarcely ever met with one in which union did not take place by the first intention.

I have no time here to enter on the treatment of complete laceration of the perineum. Unless it be attended to immediately after it occurs (which is always the best plan, just as in partial lacerations), the case will be one which will ultimately need the assistance of a surgeon rather than an accoucheur. To show how rare such an occurrence is, I may mention that I never met with more than one instance of it in my own practice, and it happened in the following manner. I was summoned in haste one evening to see a bad case of puerperal convulsions in consultation with another practitioner. He had previously endeavoured to turn, but had not been able to complete the operation, which was attended with more than usual difficulty owing to the violence of the fits. I succeeded in accomplishing delivery during one of them. After delivery, the fits became less violent, and ultimately ceased, but the patient remained in a state of partial insensibility for some days. Soon after she had fully regained consciousness, she complained to the nurse that she had lost the power of retaining her fæces. On examination, we found that the perineum had been completely ruptured, the rent extending through the external sphincter ani into the rectum. Owing to the urgent nature of the case, we had not noticed the rupture at the time when it occurred, and I can only account for it by supposing that, from the violence of the convulsive attack just at the moment of delivery, one of the limbs of the child must have been forced through the perineum. The patient was afterwards operated upon very successfully by my colleague Mr. Coe.—*British Med. Journal, July* 27, 1872, *p.* 93.

79.—SHOULDER PRESENTATION, WITH RIGID OS AND PROLAPSE OF FUNIS: TURNING IMPOSSIBLE; DELIVERY EFFECTED BY SPONDYLOTOMY.

By Drs. Affleck and Angus Macdonald.

Mrs. F., aged twenty-four, residing at Kerr Street, Stockbridge, was taken in labour with her first child, about four o'clock on the morning of the 25th of April, 1872, the first indication of the approaching delivery, according to her statement, being the rupture of the membranes. At this hour the patient experienced one or two feeble pains, which, however, did not occur with regularity or severity till about ten o'clock a.m., when we saw her together. We found that there existed a very long prolapse of the cord, which already protruded from the vagina and pulsated but feebly. The os uteri was very high up, being scarcely accessible to the examining finger, dilated to about the size of a shilling, with thin and hard edges. The cervix was occupied, so far as we could judge, by a rounded mass. It was, however, at this period impossible to ascertain, with anything approaching to certainty, what was the presentation. The woman was, during our visit, almost entirely free from pains. We put her in the knee-and-elbow position, and endeavoured to return the cord, but without success.

Feeling convinced that in this state of matters it was utterly hopeless to attempt to save the life of the child, we desisted after a short time from further interference. During the day the patient had slight irregular pains, which made little impression upon the os. About seven p.m. uterine contractions set in with regularity and with considerable force, and the os uteri began gradually to yield; but long before this time the cord had ceased to pulsate. We saw her together at nine p.m., and came to the conclusion, in accordance with a suspicion which we had already entertained for some hours, but even at this period verified with considerable difficulty, that the presentation was that of the shoulder. The diagnosis was, however, exceedingly difficult to establish, owing to the high position occupied by the presenting part, the rigid state of the os, and the obstruction occasioned by the large mass of prolapsed funis. We also ascertained that there was decided narrowing of the conjugate at the brim, though it was impossible to quantify the degree of contraction. The cervix was now dilated to about the size of half-a-crown, and was, moreover, in a more yielding and less resistant condition. With the view of facilitating the dilatation, we introduced No. 8 of the india-rubber dilators, and distended it to the full, allowing it to remain in the cervix for upwards of a quarter of an hour, the patient having been meanwhile anæsthetized. When the dilator was removed, it was found that the os uteri had expanded nearly so far as to admit the hand. After increasing the dilatation by the use of the fingers for a short period, Dr. Affleck succeeded in introducing his hand within the uterus. He now found that the child lay across the womb, with its back anteriorly, and the head directly to the right of the mother. The introduction of the hand into the uterus was attended with the greatest difficulty, inasmuch as the organ was now in a condition of powerful and persistent contraction, which every attempt to move the hand in its interior intensified. Notwithstanding that the patient was very deeply anæsthetized, the contractions of the uterus were such as to cause Dr. Affleck excruciating pain in the hand which was introduced. After considerable difficulty and some delay, the right foot of the child was reached and brought down into the vagina, into which the left arm of the fœtus had by this time prolapsed. Traction was continued with as much force as was considered at all justifiable, whilst efforts were made both to push up the shoulder per vaginam, and to aid version by accessory manipulation over the abdomen. By this time Dr. Affleck's hand was so thoroughly exhausted that Dr. Mac donald relieved him, and continued the efforts at version till, as no success whatever seemed to follow these attempts, it was considered that it would be perilous to the patient further to persist in them. After a little deliberation, it was agreed that the safest and most desirable method to effect delivery was to perform embryotomy in some form or other. After carefully examining the relations of the parts—and this was facilitated, now that all attempts at version were given over, by pulling down the presenting shoulder by means of traction upon the prolapsed arm—it was found that the spine was sharply bent back over the inlet into the pelvis, and that the head lay so high up in the rigidly contracted uterus, that it was exceedingly difficult, if not altogether impossible, to reach the neck so as to perform decapitation. It was therefore resolved to attempt spondylotomy in preference to evisceration, as the more advisable operation in the circumstances. Dr. Macdonald having procured a pair of long vaginal scissors, which unfortunately happened to have both the blades sharp at the points, proceeded to the operation, whilst Dr. Affleck steadied the body by traction upon the presenting arm, and pressure upon the uterus externally. After a little difficulty, an opening was effected into the thorax, in the left axilla. Into this opening two fingers were introduced so as to push aside the contents of the chest, and feel for the vertebral column; since, owing to the scissors being sharp-pointed, the operator feared to clip round in an intercostal space, as is usually recommended. Having reached the spine at the part where it was most sharply bent, which proved to be the second dorsal vertebra, it was clipped through without any great difficulty. After we had both satisfied ourselves that the spine was completely severed, traction was resumed upon the foot which had originally been brought down, and this time with complete success, although considerable force was needed to bring the breech through the brim. Still greater difficulty was experienced with the head, and very considerable traction efforts had to be employed for a time. The child was, however, removed entire, though the bones of the arm and leg which had been pulled upon, had given way in several places. The fœtus was a large well-formed male. The placenta separated spontaneously, and was expelled in about five minutes after the birth of the child. The delivery was completed by two o'clock on the morning of the 26th April. There was no post-partum hemorrhage, and the patient's pulse, when we left, was of good strength, and at the rate of 78 per minute. For the next twenty-four hours she had some tenderness over the uterus, but her pulse kept constantly below 84, and, except on one occasion, there was no vomiting. The lochia were copious, and the secretion of milk appeared in abundance on the third day. There never was the least tympanites, and the patient passed urine voluntarily six hours after her delivery, and continued to do so normally. She has subsequently gone on in every respect favourably, and is now perfectly well.

From our measurements of the pelvis immediately after delivery, the antero-posterior diameter of the brim was not over 3½ inches, though the patient appears otherwise a well-formed, large, and muscular woman, and is never aware of having suffered from disease of the osseous system of any kind.

Cases of shoulder presentation, complicated with pelvic deformity, are allowed by all accoucheurs to present very serious obstructions to every effort towards effecting delivery, and to form a class about as difficult and dangerous for child, mother, and accoucheur, as is met with in the whole range of practical midwifery. Now, we consider that the present case is one of very considerable interest in many respects, and illustrates very forcibly several important points in the pathology of parturition. It is a known fact that contractions of the brim are much more apt to be associated with mal-presentations then when the inlet to the pelvis is of the ordinary dimensions. The same condition likewise predisposes to prolapsus of the cord, and these two accidents concurred in our case. The premature rupture of the membranes, with the consequent escape of the liquor amnii, increased the complication, if it was not the immediate cause of the prolapse of the funis. Still further, the rigid condition of the cervix, preventing as it did all attempts at turning till the uterus had got into a state of chronic contraction, added seriously to the already great sum of difficulties. Besides, the greatly contracted brim, as it kept the presenting part so high up, rendered the operation which was subsequently had recourse to, as a *dernier ressort*, an exceedingly difficult one.

In regard to the operation of turning, we feel certain that not a moment was lost in having recourse to it, as, so soon as the cervix would admit the hand to pass, the attempt to effect version was begun. Besides, the foot which was grasped, being the right or upper one, proved to be that foot which, had the operator been able to make a selection, he would have preferred, as likely to aid most effectively in rotating the child. But the uterus was so closely contracted and moulded around the child, and the spinal column was so acutely bent in the upper dorsal region, and so closely jammed over the inlet of the pelvis, that no traction upon the foot of the child could in the very least degree induce rotation of the fœtus; nay more, from the position of the parts, if it had any effect at all, this must have been to aggravate the malposition by still further depressing the presenting shoulder. We used every legitimate means to elevate the head and shoulder, but all to no purpose, as the rigidly contracted uterine walls resisted all upward movement of the presenting part with perfectly invincible force. We narcotized the patient also to the greatest degree that we felt compatible with safety to her life, but with no beneficial results.

We were, therefore, ultimately driven to one or other of the various forms of embryotomy, and we think the one adopted was the most judicious, and, as it proved, both a quick and safe one. In the position of the fœtus, with the head so high up, and aggravated by the narrowness of the inlet of the pelvis, decapitation was impracticable. The blunt hook was attempted to be put round the neck of the child, with the view of testing whether the neck might not be brought within operative reach, but this proved impossible. To wait for the chance of a spontaneous version in such circumstances, with such markedly contracted pelvis, or for any chance of relaxation of uterine fibres, seemed to us equally hopeless and dangerous. The operation of evisceration is well known to be both tedious, troublesome, and difficult; while it presents facilities for ultimate delivery inferior to the operation of spondylotomy, and is certainly more dangerous for the patient. Spondylotomy is, however, by no means a very easy operation to perform, more especially when executed with inferior instruments, as on the present occasion. The difficulty in our case consisted greatly in the risk that was incurred of passing the point of the scissors through the body of the child into the parts of the mother. This risk is, however, perfectly easily eliminated by providing one's self with scissors, one of the blades of which is probe-pointed. In the present instance, all risk to the mother was as far as possible prevented by the scissors being completely guarded in its introduction by the fingers and hand of the operator, and by the separation from the primary incision into the wall of thorax, on to the spinal column, being made by dilating with the fingers, without the employment of the scissors. An additional difficulty had, however, to be met, by the position of the arm being such as to place the spine of the child at the point of its body furthest away from the presenting part. The division of the spine, however, being at last effected, it was surprising with what facility the uterus allowed the breech to be brought down, and the extraction of the body to be effected. The explanation of this facility is, however, not difficult to find. In such cases the uterus has become so rigidly contracted and moulded round the fœtus, that, with the normal length of the latter conserved, it is impossible to effect version. But the incision made through the spinal column breaks the resistant bar which the child's trunk forms into two unequal portions, either of which has plenty of room to be moved with ease in the uterus, contracted though it may be. We have thus all the mechanical advantage from this operation which we could derive from cutting the child completely in twain, whilst the small opening made into the body of the fœtus allows no projecting portions of bone to injure the uterus in the expulsion of the child. Had it not been that the case presented the additional difficulty of contracted pelvis, it might have been left alone, after section of the spinal column, to be finished by spontaneous expulsion. But the contraction rendered this termination highly improbable, and as there was comparatively little force needed in bringing down the breast to the inlet of the pelvis, such delay seemed to be unnecessary.

In looking into the literature of this operation, it seems to us not to have got that attention which its very great advantages ought to secure for it. As far as we have been able to trace its history, it seems to have been first recommended by Michaelis of Kiel, who is referred to by Schroeder as having originated it. But we have not been able to verify the reference, in consequence of the impossibility of getting hold of the periodical referred to (*Neue Zeitschrift für Geburtshülfe*, Band 6, s. 50). In a case recorded by Prof. Inglis, of Aberdeen, in the *Edinburgh Medical Journal* for February, 1866, Sir James Y. Simpson performed it successfully. According to Dr. J. W. Black, as shown in a footnote appended to the reference to that case, in *Simpson's Selected Obstetrical Works*, page 502, Sir James Y. Simpson had previously effected speedy delivery by cutting through the spine without eviscerating, in two cases, so that Dr. Inglis's case seems to have been the third in which Sir James had performed the operation. Undoubtedly we owe to Sir James Y. Simpson the introduction into obstetrical literature of the very expressive and definite term for the operation, spondylotomy (from *σπόνδυλος*, a vertebra, and *τέμνω*, I cut). As far back at least as 1854, Drs. Priestley and Storar, in their edition of his *Selected Obstetrical Works*, mention that Sir James was in the habit of recommending section of the spinal column in cases of cross-birth, in which turning was found impossible. So far as we can make out, however, Michaelis wrote before this period. Whether Sir James, who does not seem to have laid any claim to the operation, was aware of his writings on the subject or not, it is beyond the range of our knowledge to determine. In his *Principles and Practice of Midwifery*, Dr. Milne gives a concise and clear account of the method of operating, and refers to one or two cases which were reported in the *Lancet* of last year.

One of these cases is recorded by Mr. Orchard, of Kingussie, and was performed as early as 1847. His report in the *Lancet* is as follows :—"Mrs. R., about thirty years of age, was in labour with her fourth child. She had a contracted pelvis, and I had on two occasions delivered her by forceps and on one by embryotomy. On this occasion the arm presented, the water was evacuated, and she had been many hours in labour before I saw her. I made several attempts to turn, but it was impossible, the child lying across the uterus, rigid and immovable. I could lay hold of the inferior extremities, but no force could move it. Seeing no prospect of delivering by turning, and the patient becoming a little exhausted, I determined to deliver by cutting instruments. I used a pair of strong scissors. I introduced the point of the scissors through one of the intercostal spaces, and clipped along the space of the spine, and with the scissors cut through the spine. I then introduced my hand, seized hold of the feet, turned the child with the greatest ease, and delivered the patient. She made a good recovery. The plan I adopted is, I think, much superior to the ordinary one of disembowelling the child, and extracting it double, or tearing it out piecemeal. When the spine was cut it seemed to act like a hinge."

In the *Lancet* for 18th February, 1871, Dr. Tucker, of Bermuda, states that he performed this operation on the wife of a private in the 61st Regiment; but that he first eviscerated the thorax and abdomen, and then crushed the spine with a pair of tooth-forceps for want of better instruments. This he had performed successfully in a previous case. As Dr. Tucker first eviscerated, then cut through the spine, and finally effected delivery by bringing the fœtus out doubled up, his method is only, after all, a modified form of embryulcia.

That both in regard to rapidity of execution, and safety to the mother, spondylotomy is very far superior either to decapitation or to disembowelling, there seems to us to be no doubt whatever. To decapitate is, under ordinary circumstances, no easy task, and in the one before us would have been extremely difficult, nay, we think almost impossible, owing to the contraction of the pelvis, and the high position of the head in the rigidly contracted uterus, while it is an operation fraught with no little danger as ordinarily performed, since it is exceedingly difficult to prevent the sharp hook of Ramsbotham or any similar instrument from penetrating the mother's parts. Also the projecting bones in the ends of the two portions into which the fœtus is divided present an additional difficulty from their liability to injure the uterus. Besides, in a case like ours with contracted pelvis, we would, in a measure, merely have been exchanging one difficulty for another nearly as formidable, if we had divided the neck ; since, while the body would have been removed with no great difficulty, the head would have offered great resistance to every endeavour to pull it through the contracted brim. Most likely we should have had to diminish its size, and get at the same time a firm crotchet hold upon it by seizing it with Simpson's cephalotribe, which we had brought along with the scissors in case of emergency. Besides this, cutting through the whole of the neck with scissors instead of with Ramsbotham's hook, even when it is applicable, as we hold in this case it was not, is both a much more difficult and dangerous operation than spondylotomy ; seeing that, in performing the latter operation, the mother's parts are completely protected by the screen formed of the child's parts, and thus risk of wounding the uterus is greatly avoided.

One method of delivering in these cases, of recent introduction, possesses such a degree of simplicity, however, as to merit special notice when we are on the subject.

In the *Archives Générales de Médecine*, September, 1865, Professor Pajot contributes a paper on the presentation of the shoulder in extreme contractions of the pelvis, and on a new method of embryotomy, which latter consists in getting a piece of whip-cord round the neck or body of the child, and performing section by means of it. One end of the cord is to be passed over the neck or body of the child by means of a blunt crotchet in which is a groove for the string. A piece of lead is attached to the end of the string, which is passed over the child so as to facilitate its downward movement over the fœtus. The two ends of the cord are then to be secured in a tube or speculum formed of wood, introduced into the vagina so as to prevent the maternal parts being injured by the tensified cords. The ends of the cord he then recommends to be rolled in succession separately round each hand of the operator until about nine inches from the vulva ; then laying hold of each end of the thread by the base of it, one after the other, he recommends the execution of a rapid series of to-and-fro motions in a sawing manner. Thereby, he states, that the neck of the fœtus can be separated from the trunk in some seconds. In the case where the neck is inaccessible, he states that section of the body is quite easily performed in the same manner, only that to divide the trunk in the region intermediate between the iliac crests and the scapulæ requires in general from four to five minutes. The great advantage of this method is, of course, its simplicity, and the very trifling number of instruments that are absolutely required. In this latter case it is almost superior in simplicity to spondylotomy, which needs tolerably strong scissors. It is scarcely possible to believe, however, that whip-cord could have sufficient resistance to make section of the neck or trunk of the child ; and, of course, this operation, even when successful, does not do away with the risks of laceration of the mother's parts by means of projecting fragments of bones ; whilst in the case of decapitation, it lands us with all the difficulties of removing the head last from the uterus. So convinced is Pajot of the risk attending the ordinary method of delivery in cross births in cases of contracted pelvis, that he recommends—1st, In cases of contraction under two and-a-half inches, when the infant is at full term, and version by external manipulation has been fairly tried with the view of facilitating the application of instruments, and has been considered impossible, the performance of cæsarian section ; 2nd, When the fœtus is not at the full term, and version considered impossible, to favour spontaneous evolution by amputation of the arm ; 3rd, If this does not succeed, to effect embryotomy according to his own method.—*Edinburgh Medical Journal*, *July*, 1872, *p.* 89.

80.—A SUCCESSFUL CASE OF IMMEDIATE TRANSFUSION.

By Dr. J. H. Aveling, Physician to the Chelsea Hospital for Women.

The following satisfactory case of transfusion proves that the old "immediate" method of performing the operation has many advantages—so many, indeed, as to lead to the belief that it must ere long be adopted by the profession. For one hundred and fifty years no other plan was known ; and it is only during the last half-century that "mediate" transfusion has been in vogue. The delay and difficulty in operating and the deteriorated condition of the blood transmitted are the great objections to this latter method. If it can be shown that the immediate plan is as successful as it is simple, transfusion will assume its proper place among the remedies of the healing art, and will be used both by physician and surgeon in all cases where deterioration or loss of blood threatens extinction of life.

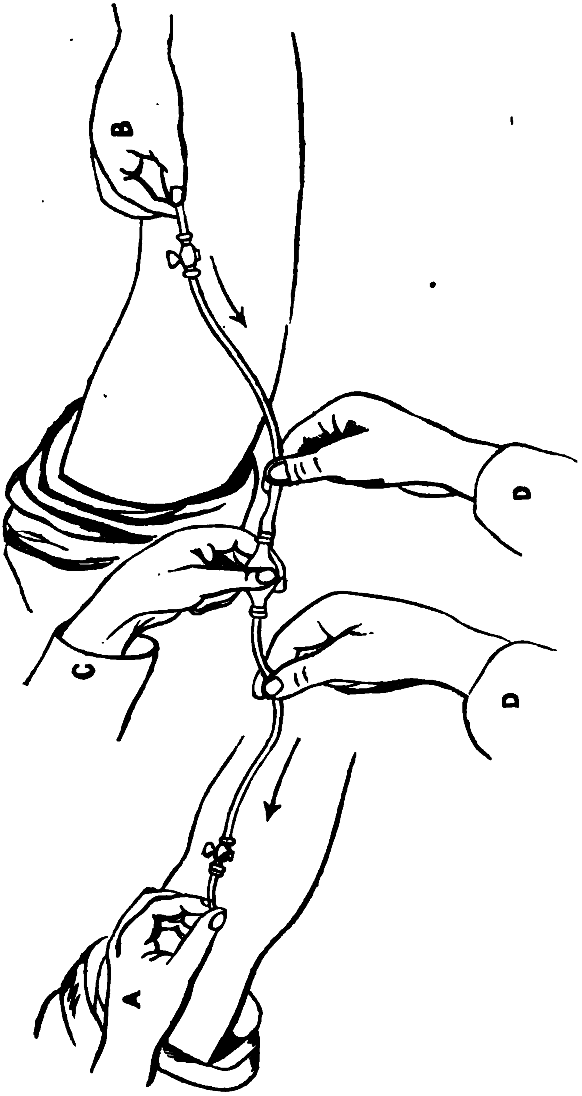
Mr. F. E. Webb, of Maida-vale, has kindly furnished the following notes of this case previous to the time of my being called in :—

"Mrs. W., a small, fair lady, aged twenty-one, of rather delicate constitution, was seized with abdominal pains on the evening of March 24th. Early on the morning of the 25th I was sent for. The pains were frequent, but there were no expulsive efforts. The os was slightly dilated and the vaginal secretion abundant. Labour proceeded slowly, owing to the brim of the pelvis being narrow ; and the child's head did not descend into the cavity of the pelvis until one o'clock, when sharp expulsive efforts commenced. At two o'clock I began to give her chloroform at intervals, but not to insensibility at any time, until the child was born at 3.30 p.m. As soon as the child was detached smart hemorrhage set in. I sent for ice, gave ergot and brandy freely, and, grasping the uterus, excited it to vigorous action. The hemorrhage continuing, I found it necessary to detach the remaining half of the placenta, which was unusually adherent to what felt like the partially inverted fundus of the uterus. This I endeavoured to replace, but without success, as I was obliged to desist my efforts at the time lest the shock should entirely extinguish life. Blood continued to flow freely, and the patient became rapidly exhausted and faint, and no pulse could be felt at the wrist. Ice in the vagina at length checked the bleeding; but, as there seemed every probability of the patient dying, the husband was requested to go for further advice. Dr. Cheadle came first, and shortly after Dr. Meadows. At this time (4.30 p.m.) there was no great amount of hemorrhage, but we all agreed that the only prospect of saving the patient's life was to tranfuse some blood into her veins. Dr. Cheadle kindly went for Dr. Aveling, knowing that he would probably have the necessary apparatus, and would be ready to perform the operation."

I found the patient in a most dangerous state of exhaustion, insensible, and no pulse to be found in either the temporal or radial arteries. The pupils were dilated, and did not contract when a light was placed near them. The hands and feet were cold, and the lips and face blanched. The heart's action was weak, and growing perceptibly more feeble. It was evident there was no time to be lost. A fold of skin at the bend of the patient's arm was raised, transfixed, and divided; when a large flattened blue vein became visible. This was opened, and the afferent tube with some difficulty, on account of the insufficient light of two candles, was adjusted. The arm of a coachman in the employ of the family was next prepared as in ordinary bleeding, and an incision made directly into the vein sufficiently large to admit the efferent tube. The man was then seated in a chair beside the bed, and the india-rubber portion of the apparatus filled with water having been attached to the tubes the process of transfusing commenced. After a few drachms had been transmitted, Dr. Meadows, who kindly took charge of the afferent tube, thought he felt the skin rising near the incision, and suggested that the tube was not in the vein, but in the cellular tissue beside it. This proved to be true, and the tube had to be taken out and inserted into the vein. Its collapsed condition and the want of light made this no easy task; but it was at length effected, and the transfusion then went on steadily and easily until more than sixty drachms of blood had been injected. As the operation proceeded, the pulse at the wrist became perceptible, the lips less blanched, and warmth returned to the hands. The patient also became conscious for a short time, and said she was "dying." The mental improvement was not as marked and rapid as I anticipated; but this was, perhaps, due to the quantity of brandy she had taken. In a few hours, however, she became quite conscious, spoke, took nourishment, and began her fresh lease of life. The wound in her arm healed by first intention; but it opened again a few days after to allow some pus to escape, the result of the accident already alluded to. When the patient was sufficiently recovered she was placed under the influence of chloroform, and the uterus, which had become completely inverted, was returned to its normal position. After this operation Mrs. W. improved rapidly, and is now quite well. It would be ungrateful not to admit that a large part of the success of the operation is due to the able assistance I received from Dr. Meadows and Mr. Webb, and I must add, from the coachman, who was not only collected and cheerful, but able to make several useful suggestions during the process of transfusion.

Mode of operating.—The patient having been brought to the side of the bed and the arm bared, a fold of skin over a vein at the bend of the arm is raised, transfixed, and divided. The flattened vein now brought into view should be seized with a pair of fine forceps, and raised while an incision is made, and the bevel-pointed silver tube inserted into it. The tube should be filled with water, and kept full by placing the thumb over its larger opening. While the operator is doing this an assistant should prepare the arm of the blood-donor as in ordinary bleeding, making an incision direct into the vein, and passing the round-pointed tube into it, with its points towards the fingers. This person should then be brought to the bedside of the patient, and seated in a chair. No ligatures are required. B represents the hand of an assistant holding the efferent tube, and the lips of the small wound together, and A shows the afferent tube secured in the same manner. The india-rubber portion of the apparatus, filled with water and kept so by turning the cock at each end, is now fitted into the nozzles. The cocks are then turned straight, and the operation commenced by compressing the india-rubber on the efferent side, D, and squeezing the bulb C. This forces two drachms of water into the afferent vein. Next shift the hand D to D′, and compress the tube on the afferent side; and then allow the bulb to expand slowly, when the blood will be drawn into it from the efferent vein. By repeating this process any quantity of blood can, at any rate, be transmitted, the amount being measured by counting the number of times the bulb is emptied.

This instrument was invented and shown to the Obstetrical Society in 1864. Dr. Oré, who published an excellent work on transfusion in 1868, describes an apparatus similar to mine, except that it has valves. These are objectionable,



inasmuch as they get out of order, and whip the blood when passing through them. He agrees with me, however, concerning the relative values of the "immediate" and "mediate" methods. He says, in performing transfusion by the immediate plan, his experience has shown that embolism is easily avoided, and that the defibrination of the blood is useless in man, as it does not coagulate for four or five minutes after it has left the vessels.—*Lancet*, *August* 8, 1872, p. 147.

81.—EPILEPTIC PUERPERAL CONVULSIONS AND PUERPERAL MANIA TREATED BY CHLORAL HYDRATE.

By F. Victor M'Dowell, Esq., Ex-Demonstrator of Anatomy, Dublin School of Medicine, Ballickmoyler, Queen's County.

On the 1st of March, 1871, at 12 p.m., I was called to see a poor woman in labour, named Ellen B., aged 40, living in this district. I was told she had been in "fits" all the day. She is the mother of seven children; the last was stillborn, and her health has been very delicate since. For the past month she complained of giddiness and noises in the head, and puffing of the face. On my arrival I found her suffering from epileptic convulsions. The paroxysms occurred periodically, like labour pains, during one of which, and shortly after I had seen her, she gave birth to a still-born child. The placenta was soon expelled without any assistance, and with very little loss.

The patient was totally unconscious, and breathing very heavily; however, the convulsions did not end here, but after a few hours became more frequent.

At the approach of each paroxysm the pulse would become extremely quick and weak, the pupils dilate, the skin turn dark or purple, and the muscles become extremely rigid from head to foot, but would soon be thrown into violent convulsions, during which the distortion of countenance was beyond conception. There was frothing and hissing from the mouth, which was drawn chiefly to the right side, her urine and fæces passing involuntarily. Her head was shaved with much difficulty, four leeches applied to each temple, an opiate enemata administered, and cloths soaked in iced water to be kept constantly on the head.

The "fits" which, previous to this treatment, occurred every hour, and each lasting about ten minutes, were completely checked, and the woman left sleeping tranquilly.

Heard next morning she awoke *quite well*, but after three or four hours became light-headed.

Saw her next day, and she was then totally unmanageable; the delirium and jactitations were incessant, restraint being sometimes necessary. The patient was now placed in a darkened room, with a careful attendant, the cold application to be kept to her head, and a large blister applied to the nape of the neck. A full dose of calomel and jalap administered, and after its operation two grains of James' powder and a half a grain of opium, to be given every three hours for six doses. For five days there was no abatement of the maniacal symptoms, and as the patient had not slept any during that time I determined, as a *dernier resort*, to give chloral hydrate a trial, as I had never heard of its use in such a case before. Twenty-five grains were administered in syrup, and repeated after three hours. This seemed to act as a charm, for the woman had a refreshing sleep of three hours; and a repetition of this treatment for a few nights effected a complete recovery, as a proof of which I may mention I received a visiting ticket on the 5th of March this year, to see her again in labour, and as I found the os well dilated I applied a long forceps, and delivered her of a fine living child, and both are doing well.

It will be seen the above was a remarkable case, and those experienced in dispensary practice can well realize the difficulties of treating such—the convulsions occurring during and after parturition, and terminating in mania.

There was no anasarca. I regret failing to test the urine, and have no further proof of albuminuria than the puffing under the eyelids. The previous history of this patient failed to show that she had ever been attacked by epilepsy.

Much difference of opinion exists as to the action of opium in puerperal convulsions; however, I found it act most favourably in this case, and would certainly give it a trial again, provided there was no tendency to apoplexy.

It proved useless in the maniacal affection.—*Dublin Journal of Medical Science, June*, 1872, *p.* 464.

82.—THE TREATMENT OF INERTIA OF THE UTERUS.

By Lawson Tait, Esq., Surgeon to the Birmingham Lying-in Charity and to the Hospital for Women.

In August last, I was summoned hurriedly one morning to see a woman in labour and attended by a midwife. I found her cold, pulseless, and the bed and floor swimming with blood. It scarce needed an examination to know that the placenta was presenting. The os readily admitting my hand, and the uterus being perfectly flaccid, I at once removed the placenta, and, by the combined version, easily brought down both feet. I could get no amount of manipulation to induce contraction of the uterus; and to wait for the action of ergot was to waste time. I therefore passed my left arm under the patient, and my right arm over her, embraced the uterus between them in a direction parallel with the axis of the brim, interlocking my fingers and spreading them over as large a part of the fundus as possible. In this position, and by the external pressure, I imitated normal contractions, as one does with the forceps, and soon had the satisfaction of finding the child extruded as far as the shoulders; then, with the left hand on the fundus, and the right guiding the child, birth was soon completed. The child was almost dead, of course; but the mother made a good recovery.

Since this case, I have had on three occasions to adopt the method of external pressure in cases of inertia.

Mrs. K. confined on December 20th of her seventh child, had a large roomy pelvis; but though the passages were relaxed to the fullest and ergot administered twice, the uterus was absolutely passive. I placed her at once under chloroform, and commenced the intermittent pressure described above. In about ten minutes delivery was completed, and there was no *post partum* hemorrhage.

In September I was retained to attend Mrs. E., the mother of seven children. Her attendant informed me that nearly all her labours had to be assisted by the forceps on account of an inert state of the uterus, and that in the last two she had nearly lost her life from *post partum* hemorrhage. A few days before her confinement, the house was entered during the night by burglars, and she awoke to see one of them removing her husband's watch from the toilet-table. She was, of course, much excited, and in the morning I was asked to see her. We feared very much that the fright would exercise an unfortunate influence, and so, indeed, it proved, for symptoms of labour came on immediately. We tried by opium and rest to delay it, and succeeded for a time. At last, however, it came on, and, as before, the second stage was characterised by inertia. The pains were sufficiently severe to require anæsthesia, but whether it was continued or not, they did nothing. Instead of resorting to the forceps, as I originally intended, I employed the external pressure, and very soon had the head on the perineum. I then used the forceps to guide the head through the passages, still having the external pressure kept up. She recovered more rapidly and more completely than she had ever done, according to her own account, though she attributed this to the chloroform. It is certain that she had no after-hemorrhage.

The third case was in the person of a strongly built woman, in whose second labour the pains suddenly ceased without apparent cause. The head was nearly on the perineum when I arrived to assist the midwife. I advised the external pressure instead of ergot, and we found it perfectly successful in re-establishing the pains, and by its help labour was completed.

I feel convinced from even this short experience, like Dr. Playfair, that the method of external pressure will soon and in most cases supersede all uterine stimulants, and that the use of these will now be confined to the *post partum* state. External pressure is of great help when, from accident or necessity, anæsthesia has been pushed so as to interfere with the intensity of uterine action. I have little doubt that this communication will bring many others from obstetricians who have practised the same or similar method of external pressure. My plea is that, so far as I know, it is not used in this country as it ought to be, and that ergot is far too largely consumed by parturient women, especially when under the care of the so-called "trained midwives."

[Since correcting the proof of this note, I have seen a reference to a method of assisting the inert uterus by external pressure in Dr. Meadows' *Manual*, with allusions to the writings of Ritzen, Kristeller, and Playfair, but I have as yet had no opportunity of going further into the history of this method of treatment. It would seem to be not of older date than 1856.]—*British Medical Journal, June* 22, 1872, *p.* 668.

83.—ON DYSMENORRHŒA.

By Dr. J. Matthews Duncan, Edinburgh.

[This intractable affection has been variously subdivided by writers on the subject. It is indeed merely a symptom, and the subdivisions indicate what are believed to be the primary diseases causing it. The present paper treats chiefly of]

Spasmodic Dysmenorrhœa.—This is the chief form of the disease. When present in a high degree it is intense suffering. The pain is often so great as to produce writhing, sometimes sickness and vomiting, sometimes prostration with cold sweating. The pain is described by the sufferer as spasmodic; generally remitting, sometimes nearly completely intermitting. It may occur at any time during menstruation, or even while menstruation is absent. Generally it is severest in the early days of the discharge, and frequently most so on the second day, or before the menstrual blood flows freely.

The disease, as it comes before the physician, is generally chronic. It may have begun insidiously, and gradually increased. When it has once begun it returns with great regularity at the periods, but its intensity at different periods is liable to great variations. It is common among the unmarried, specially affects the sterile, commencing after marriage, and much less frequently the fertile.

I have not been able to arrive at any satisfactory results as to the etiology of the disease. Only it is sure that sterile marriage is frequently in some way or other a cause of it.

This disease has been long regarded as being produced by mechanical obstruction to the passage of the menstrual fluid out of the cavity of the womb, and latterly, the prevalence of this view has greatly increased, and the term stricture has been applied to the obstructing cause. The pain is then described as being produced by uterine efforts to expel the retained menstrual fluid; but real bearing-down expulsive efforts are an uncommon occurrence in this disease. There are great difficulties in the way of realizing a satisfactory theory of spasmodic dysmenorrhœa. Yet this common mechanical theory is untenable in the present state of our knowledge. The disease which naturally occurs to the mind as the analogue of so-called mechanical dysmenorrhœa is stricture of the urethra. In both, there is believed to be partial closure of the natural passage for the discharge of an accumulated and accumulating fluid. In both, mechanical means of cure are recommended, and with one merely mechanical object in view—enlargement of the passage.

The more true analogy for spasmodic dysmenorrhœa appears to be after-pains. In both diseases there is pain, uterine and of a spasmodic kind, while a bloody fluid is exuding from the interior of the uterus and getting free discharge through the cervical uterine canal. Both diseases are generally most urgent during the first and second days, and then diminish, while the discharge continues to flow still for some days longer.

The following difficulties in the way of acceptance of the mechanical or stricture theory may be stated.

The stricture or mechanical obstruction is not demonstrated. The disease is a common one; yet, on examining the uterus, its canal is, with rare exceptions, found to be as patent as in healthy women, or as in women who have no dysmenorrhœa.

The cutting instruments and tents used in dividing or dilating the supposed obstructing part or stricture are so large as to be available only when there is no stricture. Their use is itself proof that the mechanical theory is erroneous, or that mechanical obstruction does not exist.

When, in rare exceptional cases, a stricture is found—generally a congenital stricture of the external os—dysmenorrhœa is not always observed to coexist with it. In other words, extreme stricture may exist without dysmenorrhœa.

When, in rare exceptional cases, a real narrowing is found, as in congenital stricture of the external os, accompanied by dysmenorrhœa, then cure of the stricture is not found to be reliable as a cure of the dysmenorrhœa.

When there is imperforate hymen or complete atresia of some part of the neck of the womb, and consequent dilatation of the uterine cavity by retained menstrual fluid—that is, when there is absolute obstruction to the discharge, not merely a stricture—then the pains complained of are not so severe in kind or degree as in a characteristic case of spasmodic dysmenorrhœa.

Not only is there not described any stricture or mechanical obstruction, such being only imagined; but the dilatation and hypertrophy of the uterine cavity, which should be the natural result of such mechanical obstruction, are not described, and not found.

Characteristic dysmenorrhœa is observed at menstrual periods which are scanty in flow. Indeed, many authors describe scantiness of flow as the ordinary condition of the disease.

It is often observed that when the menstrual flow becomes copious the pain ceases, or that when it is copious from the beginning, the pain is slight or absent—circumstances quite inconsistent with the stricture theory.

Violent dysmenorrhœa is often present (if we may be pardoned the apparent contradiction in terms) when there is no flow, and consequently when there can be no obstruction, as in cases of imperfectly developed uterus, or cases where the uterus is replaced by a fleshy tubercle.

The disease sometimes disappears unexpectedly, and, after some healthy periods, returns again; a circumstance quite inconsistent with the existence of a permanent contraction or stricture.

The stricture theory fails at every point; for even were there a considerable stricture, yet not an absolute closing of the canal, it is impossible to regard it as an obstruction to free discharge. A very small opening—that is, much smaller than that of the natural or ordinary uterine size—is sufficient to allow easy passage to a much greater quantity of blood than seeks discharge. It is not true that any described size of passage (including the quality of length) in cases of stricture will impede the passage of any ordinary menstrual flow. This may be, and indeed has been, demonstrated by experiment. It is to the destruction or removal of the stricture that treatment is directed by the believers in the mechanical or obstruction theory. The very frequently unsatisfactory results of that treatment do not justify much confidence in the evidence supposed to be afforded by it in favour of the theory. Indeed, except in the case of the external os uteri, it has not been shown that the result of the mechanical treatment is permanent enlargement of the passage or removal of the stricture; and it is not natural to expect that such a result should follow. Incisions, at least, in the length of a mucous canal will not enlarge it, but rather have the opposite tendency.

Supporters of the mechanical theory must meet the case against them as here stated, for the most frequently occurring conditions have been supposed. In addition, they have to show what appears to me to be intensely improbable, that the force of the movement of the blood as it is discharged from the mucous membrane is so great as to distend the cavity of the body of the dense unimpregnated uterus actively and quickly.

But the theory may perhaps be applicable in special circumstances, which I shall now consider.

The canal may be closed by a plug of blood or dense mucus. This, indeed, would better account for the symptoms supposed to arise from obstruction than the imaginary stricture. But there are great difficulties in accepting this theory. For, although clots are sometimes seen in dysmenorrhœal discharge, they are by no means a necessary or even an ordinary occurrence. Again, clots would in any uterus act as injuriously as in one that is the subject of stricture, and they are not rarely observed in menstruation without there being any dysmenorrhœa. Further, if clot-plugs were the obstruction, they would stop the discharge entirely till they were displaced—a stoppage which is not described in this disease. Besides, several of the arguments against the so-called stricture tell against this supposed form of obstruction.

In like manner, many of the above detailed arguments may be made to tell against the supposition that the partial or complete closure of the cervical canal by spasm may be the obstructing cause.

It has been said that the obstruction is at the external os uteri. But this notion is entirely without foundation of any kind. Curiously, and also ridiculously enough, this allegation is made by gynæcologists who recommend incisions for the removal of the imaginary obstruction to be extended as high as the internal os uteri.

This latter part is with some reason fixed upon as the site of obstruction. It is the narrowest point of the whole uterine passage, and it is much less dilatable than the external os uteri. Besides, other indications might be adduced. But, as I have already said, no sufficient stricture has been shown in dysmenorrhœal cases to exist here; indeed, none at all. Not only does no morbid stricture exist in these cases, but the history reveals no cause of such disease coming on. Sterile marriage, for example, is a frequent alleged cause; yet it would be a bold and unjustified assertion that sterile marriage is a cause of stricture. Surgeons have not, as yet at least, found it to be a cause of urethral stricture in the male.

The analogues of dysmenorrhœa of the kind under discussion appear to me to be after-pains, strangury, tenesmus. These two last affections do, indeed, sometimes exhibit their affinity with it by accompanying it.

Patients frequently distinguish between neuralgic and inflammatory dysmenorrhœal pains, and those of a spasmodic kind. Not rarely those of one kind disappear while those of another kind remain.

When the uterus of a sufferer from dysmenorrhœa is examined during the absence of the flow, there may be nothing amiss discovered. It is a great rarity to discover anything of the nature of a stricture, for this is a rare malformation; and I can only here express my surprise at the language used by physicians, in describing to patients the nature of their cases. Such expressions as "the womb closed," "the passage too narrow," and "stricture," are frequently and certainly inappropriately used. But frequently the following conditions are observed:—An ordinary full-sized uterine probe passed into the uterus finds great and unusual sensitiveness or tenderness at the internal os of the cervix, and in the cavity of the body of the uterus; sometimes the sensitiveness is extreme, and the pain excited very violent. If the probe be allowed to remain, and the patient is asked what is the nature or character of the pain, she very frequently spontaneously describes it as the pain she has during her monthly period. A large probe, a No. 10 or 11 of the ordinary male bougie series, can frequently in the intensest cases of spasmodic dysmenorrhœa be easily introduced, if a little pressure is kept up for a minute or so, on the obstructing internal os uteri. Frequently, indeed, a much larger bougie can be passed than a 10 or 11. Sometimes, in so examining a case of this kind, temporary and partial spasmodic obstruction at the internal os can be made out. There is no difficulty or obstruction usually at the external os uteri. When a large bougie is passed through the cervical passage to the fundus, and allowed to remain, the spasmodic pain excited, at first very severe, gradually diminishes and is almost, if not entirely, gone in less than a quarter of an hour. The dilatation of the internal os is then so far effected, and probably the irritated fibres have relaxed their spasms. The pain is again momentarily re-excited in withdrawing the bougie. The pain thus produced, is the pain of the spasmodic dysmenorrhœa, but generally severer, as might be expected. It appears probable that the pain of dysmenorrhœa is produced by the flow of blood from a uterus whose irritability is increased by the performance of the function of ovulation, and by its concomitant phenomena.

When a tangle-tent is introduced through the internal os uteri, and allowed to remain, the history of the pain produced is generally as when a metallic bougie is introduced, only it lasts longer. When a metallic bougie is introduced, the dilatation is completed at once, for the time at least; but when a tangle-tent is introduced, this is not true, because, after the dilatation caused by its introduction, further dilatation is caused by the expansion of the tissue of the tent. Yet even with a tangle-tent, the spasmodic pain generally is at an end in some hours. Not always so, however, and this generally in characteristic or bad spasmodic cases. In them, twenty-four hours may elapse, and the patient be still writhing under the incomplete or still-proceeding dilatation. When, in these circumstances, an attempt is made to withdraw the tent, it is found difficult to effect the purpose; for while the parts of it above and below the internal os uteri are expanded, the part encircled by the internal os has not had as yet sufficient force or sufficient time to effect the dilatation of that part. The tent is thus firmly seized by the stricture. This stricture is found to be under half an inch from the point or inner end of the tent, and it is more abrupt at the lower than at the upper or inner side. If the tent is allowed to remain longer, it at last effects dilatation to its own full expanded size. It wears out the spasm probably.

By using successively larger and larger bougies, and allowing due time for the relaxation of spasm produced by each successive increase in size of bougie, it is easy to dilate the whole uterine passage largely, that is, till an 18 or even a larger bougie is passed.

In studying the theory of spasmodic dysmenorrhœa, it is worth while to remember the small size of the uterine extremities of the Fallopian tubes, and the possibility of spasm in these tubes, and of difficulty in the progress of the ovulum or other discharges from the tube into the uterus.

The diagnosis of dysmenorrhœa is easily made. It is painful menstruation, and it has only to be ascertained that the patient is probably or really menstruating. To diagnose simple dysmenorrhœa, it is necessary to ascertain the absence of any complicating uterine disease which may induce the pain directly or indirectly, as a uterine fibroid.

To diagnose the kind of dysmenorrhœa is generally easy, so far as such diagnosis goes. The different kinds may be conjoined; a dysmenorrhœa may be at once neuralgic, inflammatory, or congestive and spasmodic. To describe the diagnosis would be merely to repeat what has already been said under the head of symptoms.

The treatment of spasmodic dysmenorrhœa is highly unsatisfactory.

In slight cases, relief is gained by the popular remedies directed to increase the discharge. These are the hot pediluvium, and the swallowing of alcoholic stimulants, or of sal volatile. In somewhat severer cases, benefit is got by the use of antispasmodics, and the weaker sedatives. Among such remedies, the chief are ether, hyoscyamus, Indian hemp. Diaphoretics are also useful.

In the severer cases, all such remedies are of no avail. Relief can be secured by anæsthetic inhalations, or by the use of opium in some form. Many authors recommend the use of special preparations of these kinds of medicines, and often special methods of using opium, as by the mouth, by enema, by hypodermic injection; but after many trials of all methods, I have failed to discover any decided advantage in one method or another.

It is obvious that this kind of treatment is not in any sense curing. It is a poor compromise which really consists in the drowning of a pain, or a painful disease, by another artificially-produced disease, which is probably more injurious to the constitution generally. Intoxication for a day or thereabouts by chloroform or by opium every month, is a morbid condition which has many disadvantages and dangers of its own. Yet there are cases in which the pain of dysmenorrhœa is so severe that the practitioner is glad to resort to these drugs.

Dysmenorrhœa is often associated with sterility. Both are conditions which induce women to insist upon treatment, and to make them regardless of risk. But it requires to be kept in mind by the practitioner, that he is not justified in using a remedy whose proper risk is out of due proportion to that of the disease which he is treating. A so-called radical cure has long been in use for this disease. It is dilatation of the cervix uteri, and its introduction was a matter of course, when the mechanical or stricture theory of the disease was conceived. But the value and application of the treament by dilatation have no essential dependence whatever on the truth of the theory which led to its adoption.

It is proposed to effect dilatation of the cervical passage in various ways; by scissors, by metrotome, by sponge or laminaria tents, or by metallic pessaries allowed to remain for some length of time, by bougies allowed to remain only a short time, and by dilators whose use takes only a short time.

The scissors is used to open up the external os of the cervix by those who believe this part to be the seat of obstruction. An ordinary scissors will answer the purpose, but special scissors have been constructed for the operation. It is easy to snip through the vaginal portion of the cervix at each side, and thus make a free opening into the cervical cavity. The wounds heal without restoring the small size of the original os—a result which can be easily understood on considering the arrangement of the parts. The operation may be compared to what may be called making an artificial hare-lip. Were the external os the seat of obstruction, this would be the proper operation for curing dysmenorrhœa. But I believe it is quite useless, except in the rare cases of abnormally small external os; and in them it cannot be trusted to as a cure of dysmenorrhœa should that disease complicate the malformation. If the external os is the seat of the disease, it is, of course, at least foolish to interfere with deeper parts. The plan of dilating the external os by incisions commencing at the internal os is ridiculous, both in a theoretical and practical point of view.

The great and rational attempts at a so-called radical cure, are directed to produce dilatation of the internal os of the cervix. If any particular point can be called the seat of the disease, this is the part. Many means have been, as already said, proposed and used with this object in view; but it is very doubtful whether or not any of them effects the purpose otherwise than temporarily. Cutting instruments appear at present to be the favourite tools, and it appears to me highly improbable that the result can be ultimately other than induration of the canal or passage by the resulting cicatrices. Experience, however, is the best test of their value, and may prove it; even although the theory of mechanical obstruction may at the same time be shown to be false.

The instruments for bloodless dilatation of the internal os of the cervix may be divided into two classes:—1. Those allowed to remain for at least a day. 2. Those not allowed to remain above a few minutes.

The former class includes sponge tents, laminaria tents, metallic pessaries. The dilatation by tents is effected in the course of one or two days. The same is true of the metallic pessaries, but it is usual to allow these to remain for a long time,—that is months or years,—if they do not excite acute inflammation. Various metrotomes have been invented to incise the internal os uteri, and the operation is easily performed. Hemorrhage is not unlikely to occur, especially if the incisions, which are made laterally, are made too deep. This hemorrhage is arrested by a perchloride of iron plug in the cervix. Various injurious and useless plans are recommended to prevent, as it is said, the wound from closing, or from closing improperly.

I have used all these means of dilatation, and have been most extensively a witness, directly and indirectly, of their employment by others. The sanguine proposers of these methods have produced no satisfactory data to support their practical recommendations, and I regret to say that I have none prepared to support my own opinions. The absence of data is to a great extent justified by the impossibility of making good evidence out of them. Indeed, in the absence of any kind of odynometry, we must be content with a distant approach to good evidence. Some physicians appear to cure their cases as well and quickly without dilatation as others do with it. Yet, in the hands of every gynæcologist, there are many inveterate cases of severe dysmenorrhœa, and it is upon these alone that any dilatation should be even proposed to be tried.

My knowledge of the results of the use of the means hitherto spoken of may be summed up in a few sentences. Not unfrequently they produce a complete cure for one period; and this is no gain, because the pain (not to speak of the danger) of the operation is a set-off against it. Rarely their beneficial effect is more lasting, the cure being partial or complete. Not very rarely they have caused death either by hemorrhage or by inflammation. Very frequently they have caused cervical catarrh, endometritis, parametritis, perimetritis, ovaritis, with all their attendant ills. Frequently they have aggravated the dysmenorrhœa. In short, their use has been most unsatisfactory. So much has this been the case, that, in common with those friends on whose experience and judgment I have most reliance, I have been reluctantly forced in the meantime to discontinue the use of a most promising remedy for a most painful disease.

But the occasional apparent complete success of the plan has led me to try again the method of effecting the purpose with the least risk of doing injury, the second class of instruments for bloodless dilatation being used. This least injurious method is the oldest of all, and it has been nearly forgotten in the crowd of its modern rivals. Even of it I would not wish to be thought to speak definitively. It involves the infliction of no wound; the instrument used remains in the womb only for a few minutes at a time, and sufficient time is left between the repetitions of its use to allow the disappearance of the irritation it causes. This method certainly causes much pain; but if it do not cure, it appears to me to cause, in the very great majority of cases, no injurious inflammation.

The operation is performed between two monthly periods, and it consists in introducing as large a bougie as will easily pass (a 10 or 11 in the ordinary male urethral series). On each successive day a larger bougie is introduced, till after several introductions, say seven, a large bougie is passed (an 18 or 19 in the ordinary male urethral series). The bougie to be passed does not enter the cavity of the body of the uterus at once, but moderate pressure continued for about a minute secures its passage. The dysmenorrhœa-like pain produced is severe, and lasts for about fifteen or twenty minutes, and then the bougie is withdrawn.

All the varieties of treatment, medicinal and other, applied in other forms of the disease are also tried in this form, and success is said occasionally to follow their use.—*Edinburgh Medical Journal, May*, 1872, *p.* 961.

84.—ENLARGEMENT OF THE UTERUS CONSIDERED SPECIALLY WITH REFERENCE TO DIAGNOSIS.

By Dr. Lombe Atthill, Fellow and Examiner in Midwifery, College of Physicians, and Obstetric Physician to the Adelaide Hospital, Dublin.

[Dr. Atthill commences this paper by insisting upon the necessity for the frequent use of the uterine sound, except when contra-indicated by the existence of some special cause.]

Enlargements of the womb are met with in a very large percentage of those cases in which the symptoms are referable to the female organs of generation. Nor is this a matter of surprise when we remember the changes the uterus undergoes. In the virgin state but a couple of inches in length and an ounce or so in weight, it becomes, under the influence of pregnancy, developed into a large organ capable of containing the full-grown fœtus, and weighing several pounds; consequently any circumstance which retards or prevents the return of the uterus to its normal size after delivery, may produce, as is now well known, a condition which often results in permanent enlargement, a condition to which, as I have already explained, the term "subinvolution" is applied. But, in addition to these great changes, the result of pregnancy, the uterus every month, as each catamenial period comes round, increases in weight and, probably, somewhat in size; if, from any accident or imprudence, the natural flow is then checked, that temporary increase may become permanent, an accident which, I am satisfied, is far from being of unfrequent occurrence. Here, then, at the outset, are two palpable causes of enlargement of the uterus.

But we meet with cases of enlargement of the uterus which cannot be referred to either of these classes. Women who have never been pregnant, and never have had any derangement of, or departure from, healthy menstruation, and women who, having conceived, have subsequently enjoyed uninterrupted good health for years, during which pregnancy undoubtedly did not take place, nor yet any derangement of menstruation occur, occasionally begin to suffer from symptoms referable to the uterus, and, on examination, these are found to be due to enlargement of that organ. In such cases, I believe this condition may depend on inflammation of the substance of the uterus, either of an acute or chronic character; on simple hypertrophy of the muscular and areolar tissue of the uterus; on fibrous tumours developed in the walls of the uterus; and also, as all are aware, on the existence of intra-uterine tumours of any kind, whether they be polypi, fibrous or cancerous tumours. But it is not my intention to enter at all on the subject of either uterine polypi or uterine tumours, except with reference to the question of diagnosis. I also purposely omit all reference to the actual existence of pregnancy, or to the retention of any of the products of conception in the uterus, as being foreign to the subject to which I wish specially to direct attention.

To recapitulate, we meet with enlargement of the uterus as the result of—

1st. Subinvolution of the uterus after labour or abortion.

2nd. Congestion of the uterus from suppression or retardation of menstruation.

3rd. Acute inflammation of the uterus, or possibly of its peritoneal covering.

4th. Chronic inflammation of the uterus.

5th. Hypertrophy of the uterus.

6th. The stimulus given to the uterus by the development in its walls of fibrous tumours.

7th. The existence of intra-uterine tumours.

1. Subinvolution of the uterus is now a well-known cause of uterine enlargement. There is no doubt but it is most likely to occur in those cases in which any form of inflammatory attack, whether it be peritonitis, metritis, or cellulitis, takes place subsequent to delivery. This fact has been pointed out by several writers. If, then, a patient has suffered from any such attack, the possible effect of it in retarding the normal reduction in the size of the uterus, which should take place within a few weeks subsequent to delivery, must be borne in mind, and we should, in such cases, carefully watch for any symptom indicating the presence of this condition. As a nearly invariable rule, profuse menstruation is the first and most prominent symptom indicating the existence of enlargement of the uterus depending on subinvolution; a symptom capable of being easily explained, when we bear in mind the fact, that not only is there under such circumstances an undue amount of blood contained in the enlarged uterine veins, but also, that the relaxed condition of the muscular tissue of the uterus favours the exudation of blood. This profuse menstruation does not always occur immediately: sometimes a month or two first elapses; but, ere long, menorrhagia shows itself, frequently of so violent a character as to assume the proportions of hemorrhage, and, on instituting an examination, the sound reveals the true state of the case by proving that the uterus is abnormally elongated. The depth of the uterine cavity varies greatly in such cases. I have met with one instance in which it measured seven inches and upwards.

I have already stated, that the occurrence of profuse menstruation was the earliest and commonest symptom of enlargement of the uterus the result of subinvolution. This is so generally the case, that I have drawn the inference that the occurrence of profuse menstruation in cases of retroflexion of the uterus proved that the flexion was a secondary affection, the result of subinvolution of the uterus, and I still believe that, as a general rule, this is correct, but there are exceptions, however, to this rule.

2. The occurrence of the enlargement of the uterus from any cause suddenly checking menstruation is by no means rare, but the opportunities of proving this to be the case do not frequently occur; for if an unmarried woman complains of fulness, of pains in the head and in the back, of a sense of weight in the pelvis, and states that menstruation has been checked by exposure to cold or by some other obvious cause during the catamenial period, we are probably satisfied that uterine congestion exists; but, we are not justified in making a vaginal examination of any kind, unless, indeed, after a protracted trial, general treatment fails to relieve her. Again, if a married woman exhibits the same train of symptoms, the possibility of pregnancy existing precludes the use of the sound. Recently, however, I had an opportunity of verifying the fact. A widow, the mother of thirteen children, in whom menstruation had been irregular for three years, had in June last, after a long interval, a return of the discharge. It ceased suddenly, and she suffered great discomfort from a distressing sensation of weight and bearing down in the pelvis, and of fulness and pain in the

head. In her case the uterus was three inches in depth, while all the symptoms rapidly subsided under treatment. It may be objected that, in this case, we were ignorant as to what might have been the condition of the uterus previously; but here was a woman in the enjoyment of good health, suddenly attacked, after the abrupt checking of menstruation, with distressing symptoms, in whom the uterus was proved to be enlarged, and who was relieved of those symptoms, and of that condition by treatment. Is it not then fair to reason that the enlargement was a temporary condition, the result of uterine congestion, itself caused by the sudden checking of menstruation?

3. All modern writers agree that acute inflammation may produce enlargement of the uterus, and I believe that this may be the case, whether the patient suffers from peritonitis, metritis, or pelvic cellulitis. Of the two latter I have no doubt.

4. Chronic inflammation of the uterus being more frequently met with than the acute form, is a more common cause of enlargement. Such cases are constantly coming under observation. They are frequently found in connection with retroflexion of the uterus. Of course all are aware that it is a disputed point whether flexions of the uterus are a cause or a result of inflammation. For my own part, I am far from denying that flexions of the uterus, but more especially retroflexion, may take place independently of inflammation; still, I am satisfied that in the majority of cases, inflammation, or at least active congestion, is the primary and principal cause of these flexions, and this opinion, which I expressed in a paper published two years ago, enlarged experience has since amply confirmed. In such cases the symptoms are often very distressing.

5. Next I shall call your attention briefly to that condition which, for lack of a better name, I term hypertrophy of the uterus. I mean to include under this head those cases in which the whole of the uterus, or some portion of it, slowly and imperceptibly increases in size. Sometimes the cervix alone is implicated, that portion of the organ becoming elongated and thickened, or the body alone may be affected, while in other cases the body and cervix are equally engaged, and become thickened, enlarged, and frequently painful. The pain being apparently due either to hyperæsthesia of the nerves of the uterus, or to the pressure exercised on them by the hypertrophied tissue by which they are surrounded.

In these cases menstruation, as a rule, is but little altered in its character; sometimes it is slightly diminished in quantity, and not unfrequently becomes painful, but I do not remember meeting with a case in which hemorrhage was present. I am of opinion that the condition of the menstrual function will materially aid our diagnosis in doubtful cases; for if the enlargement be due to chronic inflammation, it will most probably be lessened in quantity; if to subinvolution or to the presence of any intra-uterine tumour, it will in general be augmented; while in cases of simple hypertrophy it is seldom altered, at least in any great degree.

The pathology of this form of uterine enlargement is very obscure; the fibres composing the muscular tissue of the uterus appear to be elongated and thickened, while there is also hypertrophy of the areolar tissue. Both conditions may have their origin in a low form of inflammation which at the time escaped observation; but we cannot, in the present state of our knowledge, say why in a certain case the cervix uteri elongates and enlarges, till by its very size and weight it irritates and causes distress; while, at the same time, in another the body and fundus of the uterus participating in the unhealthy condition of the cervix, become heavy and elongated; and in another, seem to remain in their normal condition. Excessive indulgence in sexual intercourse has been set down as a cause of enlargement and hypertrophy of the cervix, but I doubt this much. In my own practice, the case which of all others gave rise to the greatest amount of suffering and distress, occurred in an unmarried woman. Miss ——, æt. 40, came under my care nearly two years ago. She stated that about seven years previously she, for the first time, experienced pain in the back and over the pubes, and not long after a sense of weight in the pelvis, and I saw that her suffering had ever since gradually increased. When I saw her she could not sit up for any length of time, and walking, even a short distance, caused much distress; she also complained of a troublesome itching at the vulva. On instituting a vaginal examination, the cervix was found to be elongated to the extent of at least an inch. It was thickened and hypertrophied, the supra-vaginal portion evidently participating in the abnormal condition of the organ. Menstruation continued to be performed regularly, but it was attended with much pain. She has ever since been under observation, though I have long ago abandoned any active treatment. This lady has been treated by leeching, by blistering, by the administration of the iodide of potassium and of the bichloride of mercury, and it is hard to say which of these did the least amount of good. The uterus has steadily increased in size, evenly and universally, and with its increase so have her sufferings increased, till now she has become a complete invalid. In her case I at one time, before the body of the uterus became so manifestly enlarged, entertained the idea that amputation of the cervix might, by removing the cause of local vaginal irritation, be productive of benefit. But, as the operation certainly was not entirely free from risk, and as I became satisfied that the supra-vaginal portion of the uterus also participated in the diseased condition, I abandoned the idea. In this case I feel perfectly satisfied that the hypertrophy commenced at a very early age and gradually increased; it bears a strong resemblance to one recorded in Vol. ii. of the work on *Diseases of Women*, by Bernutz and Goupil, published by the Sydenham Society. Another case of hypertrophy of the cervix in an unmarried woman has since come under my observation. She is a dressmaker, æt. 28, an industrious woman, sitting at work upwards of twelve hours a day. She complained of weight in the pelvis and of bearing down. She also suffered from the most obstinate constipation. Menstruation was regular, but generally accompanied by pain. On making an examination the os uteri was found to rest on the perineum; the cervix was elongated and thickened, and the fundus slightly enlarged. This woman would not come into hospital, and consequently I have had no opportunity of trying the effects of treatment, from which, in truth, I would anticipate but little benefit.

Any person who has read the work just mentioned will at once see that the condition I am now referring to is very similar, if not analogous, to that termed by M. Huguier, "hypertrophic allongement" of the uterus, a condition which he divides into two classes—namely, sub-vaginal and supra-vaginal, a division the actual value of which I do not highly appreciate. I am inclined to the opinion that, although we may have enlargement of the body of the uterus without the cervix being engaged, the cervix is never enlarged for any length of time without the supra-vaginal portion of the organ becoming implicated in the disease. I also believe that not a few of the cases recorded by M. Huguier were cases of subinvolution of the uterus following delivery, and not of the condition which I have termed hypertrophy.

But, in addition to these cases of hypertrophy with elongation of the cervix or of the body of the uterus, or of both, we meet with cases in which there is no elongation, but the very reverse. We sometimes find the cervix shortened, drawn up, as it were, into the body of the uterus, and sometimes disappearing altogether. In such instances the body of the uterus assumes a globular form. This form of enlargement gives rise to considerable distress, and it seems specially to cause intractable irritation of the bladder. In one case, which was for years occasionally under my observation, this symptom was the prominent one, and that for which the patient sought relief.

There is no form of uterine disease in which so little good can be effected by treatment as that to which I am now referring. If the body of the uterus be engaged, it seems nearly useless. If, however, we are satisfied that the cervix only is affected, amputation may be resorted to with advantage; or possibly local depletion and subsequently the repeated application of Dr. Greenhalgh's iodized cotton may effect some good.

It remains for me to allude, and I shall do so very briefly, to that form of uterine enlargement in which the organ is stimulated, and increases in size, from the presence of a fibrous tumour imbedded in, or growing from, some portion of its walls. Cases are recorded in which a fibrous tumour of very small size, perhaps not larger than a nut, so stimulated the uterus that it increased to five or six times its normal size, the cavity too being proportionally elongated. These cases are most perplexing, a *post-mortem* examination alone being capable of revealing their true nature. Fortunately they are not of frequent occurrence. I have not myself met with any case in which I was satisfied of their existence. In the great majority of instances a fibrous tumour sooner or later will bulge into the cavity of the uterus, or project out on the peritoneal surface. In either case the tendency of the disease is to render menstruation more profuse; while in that form of enlargement depending on hypertrophy of the fibrous tissue of the uterus, and which is the only form liable to be confounded with the one now under consideration, menstruation, if interfered with at all, is more likely to be diminished than increased. The subject of fibrous tumours of the uterus does not come within the scope of the present lecture. I wish, however, to draw attention to those cases, of by no means infrequent occurrence, where enormous fibrous growths exist in which the womb is imbedded and almost lost. These cases have over and over again been mistaken for ovarian tumours, a mistake which the use of the uterine sound may help us to avoid. It tells us not only what is the length of the uterine cavity, but also whether the uterus is free or imbedded in the tumour.

Now, as to diagnosis. I have already stated that the sound and that alone enables us to decide as to whether the uterus be enlarged or not, but it affords us no clue as to the cause of the enlargement. A few general rules, however, if they do not enable us to give a positive diagnosis, will at least facilitate materially our decision as to the nature of any case. Thus, if we meet with an enlarged uterus in a woman who has aborted or been delivered at the full time, even though a considerable interval has elapsed, the probability is in favour of the enlargement being dependent on subinvolution, and this opinion will be confirmed if, as is nearly always the case, menorrhagia be present. If again metritis, pelvic cellulitis, or peritonitis be present or have occurred recently, the inflammatory action is fully sufficient to account for the condition of the uterus, and it should be always borne in mind that it does not follow that the enlargement will disappear with the subsidence of the inflammation; so again, in other cases, we should ascertain if menstruation has been checked or suppressed, and if symptoms referable to the uterus have followed on this; or if again, pain in the back and over the pubes was first noticed, menstruation being subsequently lessened or suppressed: in the former case we are likely to find that the enlargement depends on congestion, in the latter on chronic inflammation, while hypertrophy steals on gradually, menstruation being seldom interfered with; and it is of no small importance to decide to which cause the enlargement is due, for while much may be done to relieve the sufferings caused by enlargement of the uterus the result of chronic inflammation, treatment seems utterly powerless in alleviating those produced by simple hypertrophy of the uterus. It is, indeed, a nearly hopeless ailment, one not likely to destroy life, but to render it a burden. Then, again, if we have menorrhagia in cases of enlarged uterus, unconnected with any of the causes noticed, we may expect to meet with intra-uterine polypus, or fibrous tumours. It will then be our duty to clear up the doubt which exists, by dilating the cervix and exploring the interior of the uterus.

As I have called your attention to the subject of enlargement of the uterus, with the hope that I may aid you in arriving at a direct diagnosis in cases in which that condition exists, I shall not enter at any length into their treatment; that of subinvolution was fully discussed on a previous occasion, and I must refer you to what was then said on the subject.

In cases of enlargement following sudden suppression of menstruation, the administration of saline purgatives, and subsequently of the bromide and iodide of potassium conjointly in full doses, will generally, if the case be recent, prove sufficient; but should it be neglected in the early stages, it will probably pass into the condition of chronic inflammation, a condition over which medicines possess little influence. The prolonged use of the bichloride of mercury, in small doses, has been recommended in these cases, but in my own practice I have not been satisfied that it produced any good effect. I have seen, I think, more benefit result from local depletion by puncturing the cervix uteri, as recommended by Dr. Hall, of Brighton, than from anything else, and I think it is a mode of treatment deserving a fair trial. To be of use this must be repeated frequently at intervals of about five days. The application, to the verge of the anus, of two or three leeches, immediately after the termination of a menstrual period, where menorrhagia is present in connection with a relaxed and engorged uterus, also often proves beneficial. Both these methods act by relieving the congested condition of that organ, and thus facilitating its contraction. In conjunction with this treatment, I recommend the administration of strychnia with the addition of dilute nitric acid, or, if the patient be anæmic, with the tincture of the perchloride of iron. Strychnia is the most valuable medicine we possess in case of menorrhagia in connexion with a relaxed atonic condition of the uterus. It is, however, contra-indicated in cases of chronic inflammation, unless that condition be first relieved by local depletion.

In cases where the uterus has become enlarged and hardened, as the result of chronic inflammation, the use of the waters of Kreuznach seems to have a very beneficial effect, and if the patient's means are such as to admit of her visiting that place, a trial should be made. As to hypertrophy of the uterus, treatment is seldom likely to effect good.

In cases of enlargement of the uterus from inflammation of an acute character, I believe rest, the exhibition of opium, and warm poultices over the abdomen to be the means on which we should rely; depletion, if practised at all, should be in a limited degree by the application of a few leeches. Mercury I consider to be not only useless but actually deleterious.—*Medical Press and Circular*, *Sept.* 4, 1872, *p.* 189.

85.—ON PROCIDENTIA OF THE UTERUS, AND OF THE BLADDER.

By Dr. Evory Kennedy, late Master of the Dublin Lying-in Hospital.

Obstinate Procidentia of Uterus cured by Actual Cautery.—Mary Burke, æt. 60, a widow with six children, had obstinate procidentia of the uterus, and could not retain any form of pessary. She suffered much distress; her general health was deranged; she was dyspeptic, and had lumbar pains. She was confined to the horizontal position, with the hips well raised, for a fortnight. The ulcers healed. The uterus was placed *in situ*, and astringent injections were used. The actual cautery was then applied about an inch and a-half from the vulva round the surface of the vagina for the extent of about half an inch. My clinical clerk, who was somewhat of the Gil Blas school, in criticising his master, adds that the old woman was so indignant at this operation, which, for obvious reasons, it was deemed more considerate not to explain beforehand, that she left the hospital in a fit of indignation, because a hot iron had been applied to her inside, as she said, without saying, "With your leave, or by your leave." She eventually permitted the treatment to be followed up by the application of nitrate of silver; and the report is thus continued by my clinical critic. At the expiration of two months, she was able to go about again. The uterus was *in situ;* and she had derived much benefit to her general health and condition, and a distressing pain, descending down the front of the thigh, from which she had constantly suffered, had disappeared. The cicatrix formed by the eschar prevented the descent of the os. He adds, however, this caustic comment on my operation: "She certainly got a regular touching up."

Procidentia Vesicæ treated by Vaginal Mould.—In February 1839, Catherine Sullivan was admitted with complete procidentia of the bladder, the result of a tedious and instrumental delivery of her first child. She had had two pregnancies, and suffered from prolapsus; but the protrusion occurred suddenly about two years before admission, whilst she was lifting a feather-bed. She was treated by a variety of pessaries, and the actual cautery was applied to the interior of the vagina; but the protrusion recurred despite of all. She was kept for some time in the horizontal posture. A cast of the vagina was taken in wax, with the bladder restored to its natural position. A plaster of Paris mould was made from it; and in this a caoutchouc instrument was moulded. This she wore with great comfort and convenience. It should be mentioned that the difficulties in this case were added to by the existence of a growth supposed to be an exostosis, springing from the interior of the sacrum, and encroaching on the inlet of the pelvis.—*Medical Press and Circular, Sept.* 25, 1872, *p.* 253.

6.—ON FIBROUS TUMOURS OF THE UTERUS.

By Dr. George H. Kidd, President of the Dublin Obstetrical Society; Obstetric Surgeon to the Coombe Lying-in Hospital, Dublin.

In speaking of fibrous tumours of the uterus I have no intention of entering into the literature of the subject, or discussing the pathology and etiology of these growths. I mean simply to bring before you some account of my own personal experience in reference to them, and to do so as briefly as possible. You all know that in the books fibrous tumours are spoken of as of three classes. In my remarks I shall follow this order. We have fibrous tumours found on the outer surface of the uterus, or sub-peritoneal tumours. We have them found in the substance of the uterus, or intramural tumours, and we have them found in the interior of the uterus, or intra-uterine tumours. The sub-peritoneal tumours are, as we know, the largest, and are very frequently numerous. There are cases recorded of tumours of this kind 70 lbs. in weight. It has never been my lot to meet with a tumour of that size. Once I saw one with Dr. Denham upwards of 40 lbs. in weight, and it presented another peculiar character of these tumours—the whole mass was formed of an agglomeration of tumours. The chief importance of sub-peritoneal tumours arises from their size and their position. The remark has been made by Cruveilhier that the sub-peritoneal tumour is not accompanied by hemorrhage; but a doubt has been thrown upon the absolute correctness of this statement. At present I am not aware that we have had an actual dissection of a case where a sub-peritoneal tumour was accompanied with hemorrhage. The specimen I now lay before you seems to me one of very peculiar interest and well calculated to throw light on this question. It is a uterus having on its outer surface a very small specimen of a sub-peritoneal tumour, not larger than a large-sized filbert; but there is a soft mucous polypus growing from the inner surface, at the fundus, and projecting into the cavity of the uterus, and there is also at the os-internum a number of cystic polypi. It was a case where we had a sub-peritoneal tumour combined with intra-uterine polypi, in which the fibrous tumour might have been recognised during life and the polypi have remained undetected. I can very well imagine that in such a case as this you might have a sub-peritoneal tumour complicated with hemorrhage due to the polypus and not to the tumour. This, then, would afford a satisfactory explanation for the occurrence of hemorrhage in connexion with sub-peritoneal tumours. I have no history of that case. It was a specimen brought to the Pathological Society with others, taken out of the same body; the other specimens were those that attracted attention, but the gentleman who exhibited them was so good as to give me the specimen now before you. I could not obtain any history of the uterine symptoms during life. The chief importance, however, of these sub-peritoneal tumours is from the mechanical inconvenience they cause. These tumours, when they grow from the upper part of the uterus and rise into the abdomen, are of little importance; but they sometimes grow from the lower part, and are pressed down into the true pelvis, where they are surrounded by bone, and may give rise to very serious inconvenience indeed. I have notes of a very remarkable tumour of this kind that I had the opportunity of observing from the beginning to the end. It was the case of an unmarried lady who consulted me so long ago as 1852 for a tumour she had discovered in the abdomen. It was then about the size of a goose's egg. The late Dr. Charles Johnson saw the case with me. A second tumour developed itself as I watched the progress of the case. The tumour increased, and the abdomen became enlarged, apparently occupied by one mass, but two tumours could still be traced. In 1859 the abdomen was as large as in the seventh or eighth month of pregnancy; and at this period a portion of the tumour could be felt by a finger in the vagina lying behind the uterus and pushing that organ upwards and forwards. Attention was drawn to it by the patient herself, who found a greatly increasing difficulty in using an enema.

On examination, at this time, I found a tumour of stony hardness; and on passing a sound into the uterus, I found this organ of the normal length and, I have already mentioned, pushed upwards and forwards. The tumour behind the uterus increased in size so much, that there was a difficulty in getting the bowels to act, and at each menstrual period there was great pain in the tumour, and she suffered from great sickness of stomach. At no time was there uterine hemorrhage.

In 1861 Dr. Churchill saw this lady. The lower tumour had now increased, so as to throw the uterus quite out of reach of the finger. The whole of the upper part of the pelvis was occupied by the large hard solid mass, so tightly wedged into the pelvis as to be quite immovable; and the tumour rose in the abdomen to midway between the umbilicus and xiphoid cartilage. The constipated bowels and difficulty of defecation continued; the sickness of stomach was not confined to the menstrual periods; menstruation was regular as to time and quantity, but very painful. But the greatest source of complaint was now excessive pain along the course of the great sciatic nerve of the right side. Dr. Churchill suggested the use of an air-pessary strongly inflated, to bear the pressure of the tumour off the sacral plexus of nerves, and to gradually raise the tumour off the rectum. This was used for some months, and afforded considerable relief. The lady now went to the County Wexford, and was under the care of Dr. Isdell, who wrote to me that she had a fibrous tumour so completely blocking up the pelvis, that he thought defecation would soon be impossible.

This is a very marked example of the mechanical inconvenience arising from this class of tumours. The pain in the sciatic nerve was intense, and it was something frightful to witness her agony arising from it. The subsequent history of the case is still more remarkable and more interesting.

At the end of 1863, menstruation became irregular, and she occasionally passed "flesh-like masses," which she believed to have been coagula, as I presume they were. Menstruation now ceased, and the abdomen gradually diminished in size; the pain and sickness of stomach ceased; and the abdominal tumour disappeared without its going being in any way noticed, except from the diminution of size, which was so gradual, as to be only known by the result, and not by the process. The general health was greatly improved.

On 26th of June, 1867, I saw this lady, and examined her carefully. I could not detect any tumour in the abdomen. On passing my finger into the vagina, I found a firm round tumour in Douglas' space—movable, hard, but yielding slightly to the finger on pressure. The uterus was easily felt, pushed a little forwards by the tumour, but nearly in its normal position. The vaginal portion of the cervix and the os were quite defined. The uterus moved freely, and independently of the tumour. The patient had not known of the existence of this part of the tumour, and believed the whole had disappeared.

This was one of the most remarkable cases I have ever known of the disappearance of a fibrous tumour. I saw the case from its beginning, and the lady is still alive and still under my observation, and is herself not aware of the existence of any tumour, and I believe there is now none at all.

The pressure here was upon the rectum and the sacral plexus of nerves, and the pessary afforded the patient great relief. In other instances the pressure is upon the urethra and upon the neck of the bladder.

The following case is an example of this:—A. D., an unmarried woman between forty and fifty years of age, applied as an out-patient at the Coombe Hospital, in January, 1871. She stated that during the last fourteen months she had frequently suffered from retention of urine, and was obliged to have a catheter passed five times. On examination, a fibrous tumour was found growing from the posterior wall of the uterus, lying in the concavity of the sacrum, and forcing the uterus against the neck of the bladder. The tumour was fixed in this position. I tried first to move it with my hand by placing my finger in the vagina and pressing it up. I got the woman on her knees and elbows for this purpose, but could not move it. I then adopted a method I have on previous occasions described to this society. I placed one of Barnes' India-rubber bags in the rectum and forced water into it by means of a syringe. As I forced the water into the bag it gradually lifted the tumour out of the pelvis, got it up above the brim, and allowed the neck of the uterus to come down into its normal position. I then removed the bag, and placed in the vagina one of Hodge's pessaries. The woman complained, next day, that she had a tumour in the abdomen, which she had not had before. I have seen this woman frequently, the last time I saw her being the 29th of January, this year—a year and a few days since I lifted the tumour. It was still in the abdomen, had not returned into the pelvis, and she never had any further difficulty in passing water.

I have seen a very considerable number of cases of this kind. They illustrate a remarkable circumstance, common to many other forms of tumour besides those under consideration—that the inconvenience arising from them, although mechanical, is intermittent. This woman suffered from retention of urine, but by means of baths she got relief, except on five occasions when the catheter had to be used. I think it is a remark of Dr. Charles Johnson, that a permanent obstruction of the rectum has never been recorded as arising from the pressure of fibrous tumour, but you may have at intervals serious obstruction in the rectum. The same takes place at the neck of the bladder. It seems to me that there are three circumstances that contribute to this. I think these tumours often become increased at the menstrual period. The first case, where pain in the sciatic nerve was always aggravated at the menstrual period, is a case of that kind. Another circumstance influencing them is the condition of the bowels. Where you have the bowels distended, the tumours become more prominent, or may be forced lower down into the pelvis, and in that way pressed much more on the lower parts. These tumours are also liable to become œdematous by being in some degree infiltrated with serum.

The increase of pressure by flatulent distention of the bowels was very forcibly brought under my observation in a case I saw with Dr. Gordon and the late Dr. Beatty. It was not, however, I believe, a fibrous tumour. In Dr. Gordon's opinion it was a case of ovarian tumour; but, as it illustrates the point to which I refer, I may, perhaps, be allowed to speak of it. The case was that of a lady who had been under Dr. Gordon's observation for a considerable time for a tumour occupying the left and lower part of the abdomen. In some way the bowels became obstructed, and she was for a very considerable period unable to pass anything from them. The abdomen became enormously distended, and we had all the symptoms of intestinal obstruction. The case was one in which ovariotomy or incision for exploration was absolutely impracticable in our opinion. We felt that if we once made an incision into the abdomen, and the intestines escaped, we never should be able to get them back again, so great was their flatulent distention. After trying many means to obtain relief, we punctured the bowels. We passed a fine trocar into the transverse arch of the colon. A great escape of gas took place. The candle having been brought near, the gas took fire, and a blue flame was formed two or three inches in length. The lady suffered no inconvenience from the tapping. The next day the bowels acted freely, and continued to act for some time, until she gradually sank and died from other causes. It shows that flatulent distention of the bowels may cause a tumour to press on neighbouring organs.

The next point to which I desire to call your attention is the disappearance of fibrous tumours. In the case of the sub-peritoneal tumour that I have related, I believe the tumour disappeared by absorption. There was no escape of anything that could account for its disappearance. It is doubted whether these fibrous tumours are capable of being absorbed, but I believe this case fully proves it. Another change these tumours undergo is that of calcification, especially after menstruation has ceased, when they sometimes become converted into a cretaceous mass. Reasoning on this, the use of chloride of calcium was suggested, and Dr. M'Clintock speaks highly of it. The practice is one I have been in the habit of following for a long time. I do not know that I can give you an absolute proof of the diminution of tumours from the use of chloride of calcium, but the patients express themselves very much relieved by the use of it, and it has given more comfort than any other treatment I have seen adopted.

The next class of tumours are the intra-mural tumours. I have not much experience of my own to record with regard to intra-mural tumours. I have seen many of them, but I do not know that I have anything worthy of detaining the Society to say with regard to them. In my experience they are the least amenable to treatment, while they are the most serious, perhaps, to the patient. They cause sometimes great hemorrhage; at other times there is no hemorrhage from them. Of this I had a remarkable example—a case of intramural tumour, where I had an opportunity of dissecting the patient, and where the presence of the tumour was fully established, and yet there was no history of hemorrhage, even though the cavity of the uterus was very much enlarged. In other cases not nearly of that size, and where the cavity of the uterus was not so much enlarged, the hemorrhage was excessive. I believe the difference is owing to this—when the tumour is near the mucous surface, and presses on it, you have hemorrhage; when it is in the substance of the wall of the uterus, and grows towards the outer surface, there will probably be no hemorrhage. The cavity of the uterus may be enlarged in both cases, but not so much in the latter. When you pass a sound into the uterus you find it double or treble its normal length, and sometimes very tortuous too. Many methods have been suggested for the treatment of these cases—incision into the capsule of the tumour, gouging, incision of the neck of the uterus, &c.

I have never seen a case where it seemed desirable to adopt these methods of treatment; and, indeed, they seem more likely to be useful in cases of intra-uterine tumours, which we now know can be removed. In some cases I have dilated the uterus, and applied nitric acid. This is often beneficial; the tumour is checked in its growth, and the hemorrhage very much lessened. After a time it may return, and I have in such cases applied the nitric acid a second and even a third time. Nitrate of silver, if introduced into the uterus and left there, will check the hemorrhage; and the injection of perchloride of iron has also been used for the same purpose. That, in my experience, is the least useful and the most dangerous treatment. I have seen very serious results from perchloride of iron introduced for these tumours. The last case in which I tried it proved fatal. The woman got a low form of metritis and died. Nitric acid does not produce nearly the same amount of irritation, and it is more beneficial. The palliative treatment is of great importance in these cases, and the best form of it is plugging.

I wish to stop here to make a few remarks on plugging. It has become the fashion of late to plug with cotton, and I have fallen into the way with others. Cotton possesses some very great advantages both for introduction and removal. You take a sheet of French wadding, cut a long stripe off it, and pack it carefully in the vagina. It is not, in my experience, an efficient plug. It is a peculiarity of cotton, that as you wet it, it becomes contracted and occupies a smaller space than it did at first. When placed in the vagina it becomes wet with blood, contracts greatly, and leaves the vagina free enough to allow a discharge of blood. This may be obviated to a certain extent by wetting the cotton before introducing it. Even then it is not so good as the old-fashioned sponge plug. Sponge is the reverse of cotton; it expands when wet, and fills the vagina more completely. When the cotton plug is wet the blood will trickle past it; whereas the blood gets into the interstices of the sponge and coagulates, and the hemorrhage is arrested. I have, therefore, nearly given up cotton, as a material for plugging, in cases of these fibrous tumours. There is one way in which cotton can be rendered more efficient, and that is by saturating the first portion introduced with perchloride of iron; this produces coagulation, and the bleeding is checked. And a more efficient method, when it can be managed, is to plug the os uteri itself with a piece of prepared sponge, and it will give the patient much less inconvenience, and be a very effectual plug. Sometimes these intramural tumours are in such places that they can be removed. I have one here which was situated on the posterior lip of the uterus, and I removed it with an ecraseur.

Intra-uterine tumours may grow from any part of the uterus, but I never met with one growing in the canal of the cervix. They grow, in my experience, chiefly from the cavity or body of the uterus, and they may attain a very formidable size. There is a point with regard to these tumours that I have observed, and which I have never seen noticed by writers, and it seems to be one of considerable practical interest and importance. The tumour in one case grew from the body of the uterus, just above the os internum, and it lay in the canal of the cervix. It grew from the anterior wall of the uterus, and pressed out the posterior wall as you see it in this drawing. When a finger was passed into the vagina, the tumour could be felt like a retro-flexed uterus, the posterior wall of the uterus was so bulged out. My present experience of these tumours, where you have one side of the uterus bulged out, is that the pedicle of the tumour is attached opposite to the bulging part of the uterus. I have seen a number of these cases. In the case to which the drawing refers there was great difficulty in introducing sea-tangle, from the position of the pedicle and the shape of the tumour. When it was attempted to pass the tangle where the side of the uterus was straight, it hitched on the pedicle. At the other side it was difficult to get the tangle in, because of the convexity of the tumour. So frequently have I met with this circumstance, that the tumor bulges out the wall of the uterus opposite to where it is attached, that I have ventured to predict where the attachment of the tumour would be found, and I have been, up to the present, invariably right. The tumour I now exhibit presents this feature in a remarkable degree. It was removed from a patient of Dr. Ringland's. She had been greatly reduced by hemorrhage; and when she came under our observation the fundus of the uterus could scarcely be felt in the abdomen, but we could feel, when we passed the finger into the vagina, a large tumour under the body of the pubis. We dilated the uterus and explored it, and removed the tumours. The removal of these tumours is done by dilating the os, and detaching them with the ecraseur.

Some years ago I brought under the attention of the Society some cases of intra-uterine polypus. I gave a diagram of a case where the wall of the uterus was bulged out, and my impression then was that the polypus grew from the part where it was bulged out. My subsequent experience leads me to believe that this was an erroneous observation and that it grew at the opposite point.

The tumour I exhibit in this glass was the first large-sized one I ever removed. It was the case of a lady of very considerable position, and it was the first time I had an opportunity of trying my hand on these tumours in that rank of life. In my operations for small tumours and polypi, I was in the habit of using for an ecraseur a soft iron wire, and I thought there were advantages in using it. I attempted to remove this tumour with a soft iron wire and failed completely. My patient was very courageous and very determined. She waited a few weeks, came back to town, and I tried again, and succeeded at the first effort in removing the tumour. I succeeded because I used a steel wire, a piece of piano string, in fact, which answered the purpose admirably. The long neck of the uterus is dilated with sea-tangle until the finger can go up, and the tumour is caught and fixed by the vulsellum. The soft wire when passed up assumes the shape of the canal of the cervix, and it is difficult to expand it again so as to get it round a large tumour. By using a steel wire you can compress it to get it through the narrow os, and when you get it up it expands by its own elasticity, and you slip it over the tumour with ease. I took out the tumour in three portions. It was so broad I could not get the wire completely round it. I dragged it down by the vulsellum, took away a piece, and this gave room to take away more, and in this way the whole was removed at the one operation. I have had repeated opportunities of seeing this lady, and she is in good health, and her uterus is now normal in size and position, and menstruation is very moderate. The next large tumour I attempted to remove was this one, and I was assisted in the operation by Dr. Beatty. This grew from the fundus of the uterus, which was even and regular. It was very soon after I had failed in removing the other tumour that I was called on to operate for this. It weighed seven ounces, the other one being two and a half ounces. I kept the woman in hospital six weeks before I could make up my mind to attempt the operation. So deterred was I by the difficulty I had experienced in using the soft wire. Turning it over in my mind, Dr. Barnes' suggestion to use steel wire for dividing the fœtal head in certain cases of difficult labour occurred to me, and I determined to try it, and with it I succeeded in snaring the tumour and taking it away at the first attempt. I had an opportunity yesterday of hearing of this patient. She had been nearly dead when she came into hospital. In fact she had been taken out of her bed and laid on the floor "to die easy" according to the superstition of the country, when Dr. Clarke, of Bailieboro', who was passing by, went into the house, plugged the vagina, and checked the hemorrhage, and then had her sent to me. She is now perfectly recovered, and most anxious to return to the hospital to learn to be a nurse.

The next specimen I have to exhibit is a tumour which resembled very closely the one I removed in three portions. It was taken from a patient of Dr. Brady's;

and he and Dr. Evory Kennedy assisted in the operation. Dr. Kennedy said he saw this lady at the time of the last menstruation, and he verily believed she could not have survived such another. She is now quite able to attend to her business, and I believe is very well. The operation was performed six or eight months ago, and the case was not a promising one. When I passed my finger into the uterus, I found a large mass growing from the posterior wall, and another tumour growing in the anterior wall. We removed, in three portions, the mass growing from the posterior wall, which was all that was prominent in the uterus, but we left that which was imbedded in the anterior wall. Her first menstruation after the operation was a profuse one, and I had to plug; but her subsequent menstrual discharges have been very moderate. She is a young woman, and is every day at her place of business in a large establishment in this city.

In that case I ventured to predict before the operation, from the peculiar shape of the uterus, where we should find the pedicle. There is only one other point as to these intra-uterine tumours which I wish to speak of. Sometimes they are removed by nature. Here is one expelled out of the uterus without any interference of art. Here is another that was also expelled in the same way. In one of these cases, the lady came from Cork and placed herself under my care. I found signs of a considerable tumour in the interior of the uterus, and I made arrangements for the removal of it. An appointment was made for the operation, and some friends were requested to join me. I happened to have a very fatiguing case the night before, and begged to be allowed to postpone the operation. It was accordingly put off. That night the lady had a rigor. The next morning her pulse was 150, and she was in a high fever; and she remained in this state for a fortnight, and at its termination this mass was expelled. There was no return of hemorrhage, and she went home to the country comparatively well, and the uterus greatly reduced in size.—*Dublin Journal of Medical Science, Aug.*, 1872, *p.* 132.

87.—CASE OF IMBEDDED UTERINE FIBROID.

By Dr. James Whiteford, B.A., Greenock.

It is hoped that an account of the following case may be interesting as illustrative of the plan proposed by Dr. Matthews Duncan, for the treatment of imbedded uterine and fibroid tumours (*Retrospect*, vol. lv., p. 344), and of which I published a case in February, 1870.

The history of this case, moreover, is somewhat remarkable, from the long period of time over which the patient suffered from the hemorrhage, caused by the presence of the tumour, which, nevertheless, showed no signs of undergoing self-enucleation—a period passing even that reported by the physician, St. Luke, of the "woman who had an issue of blood twelve years, and had spent all her living upon physicians, neither could be healed of any."

Mrs. F. F., æt. forty-six—married for twenty-four years—a native of Greenock, had emigrated with her husband, and was confined of her second child at seven months, in Rock County, Wisconsin, U.S., in April, 1850. Six months after this event she returned to Greenock, where she has since continued to reside. She states that since that confinement she has never dried up. During the voyage back, she was soaking in blood the whole time, and she never expected to reach home alive, such was her prostration. For ten years afterward she was almost continuously confined to bed, and frequently fainted on attempting to get up. About a year after her return—during which time she had been under treatment—the existence of some tumour was suspected to be the cause of the bleeding, and she was, therefore, recommended by the late Dr. Mackie to see the late Professor Simpson, but she never went, as, indeed, it was almost impossible for her to be moved. Cold sitz baths, and injections of cold water, gallic acid, ergot, and other hæmostatics were assiduously employed to check the hemorrhage, but all to no purpose. From the constancy of the discharge during all those years, she could not tell when a monthly period came; but it occasionally increased to an alarming extent (probably thus marking the regular menstrual period), and frequently on those occasions she was believed to be dead, as no pulse could be felt at the wrist, and the heart's impulse alone enabled those beside her to know that she still lived. About seven or eight years ago, she began to suffer from severe pain in the left breast, for the relief of which she took laudanum, and this she continued afterwards to use, frequently to the extent of an ounce and a half daily. It is singular that, although the constant dribbling continued, still it was notably less; nor were the severe hemorrhages ever so alarming as before she began to use laudanum.

In April, last year, she first came under my notice, and an examination of the womb at once revealed the presence of a small vascular polypus, projecting from the *os*. At the same time the body of the organ felt heavier and larger, and the cervix was soft and natural. The removal of the small polypus was not followed by any diminution of the discharge, which consisted of thin watery blood. In June, I dilated the os uteri, by incising freely the cervix with a pair of scissors on both sides, and afterwards introducing as large a sponge tent as could be got in. On exploring the cavity, which was more readily effected by pulling the uterus well down, by means of a vulsella applied to the lip, a tolerably large smooth projection could be felt occupying the whole of the fundus, and not approaching the cervix. A free incision was at once made across this, about two inches in length, as nearly as I could judge, and another similar incision at an angle to this, by means of a straight bistoury, guarded with lint to within half an inch of the point. A solution of perchloride of iron was at once injected, and a plug of lint, soaked in the same, was introduced up to the cervix, until the following morning. This put an end to the bleeding, which was not very considerable. A smart attack of metritis followed this operation, and I was obliged to allow her to resume the use of the laudanum, which I had stopped from the commencement of my attendance upon her. In a few days the irritation subsided, and a fœtid watery discharge began, but no further bleeding was experienced from that day. The fœtor of the discharge was corrected almost entirely in three weeks, and her condition greatly improved, so that I ceased to visit her in July, requesting her to let me know if any further bleeding should occur. The watery discharge continued to a slight extent, but nothing occurred to mark the presence of the tumour until the beginning of December, when regular labour pains came on (but without further discharge than the serous oozing), and the patient herself states that these were more severe than in either of her actual labours. After suffering these on her knees all day—during which she did not send for me—something like a round smooth ball was felt to be in the vagina, and the patient herself pulled it away. This proved to be a flattened ovoidal mass, about three or four inches long, by about one inch in thickness. In about three weeks after this a similar labour brought away another tumour, rather larger than the former, but very like it. Only a very little blood was lost after the former of these, and none at all after the second. The patient after washing the tumours and keeping them rolled up for me, finding that they had begun to smell by the time she thought it safe to venture out, then threw them into the fire. The serous discharge dried up in less than a week: and exactly one month after the second tumour came away, a regular menstrual period came on, which lasted three days. She has since found the menstrual function quite natural; and her general health is quite restored.—*Glasgow Medical Journal, May*, 1872, *p.* 321.

88.—TWO CASES OF CHRONIC INVERSION OF THE UTERUS,

WITH DESCRIPTION OF NEW APPARATUS FOR REDUCTION.

By Dr. J. Braxton Hicks, Physician-Accoucheur to Guy's Hospital.

When inversion of the uterus has continued after the commencement of the involution process, the difficulties attending its reduction increase rapidly as that process approaches its completion; and when involution has been completed, and the organ has contracted to its normal size, the obstacle to its restitution is very considerable indeed. Besides this there is the risk that the opposed surfaces of the peritoneum, turned inward, will become adherent, and thus render reduction impossible. Hence it is always extremely desirable to reduce the uterus at the earliest possible period.

The first case narrated below is a painful example of the effects of the neglect of this rule; and in the second, although it was cured, yet a large amount of treatment might have been avoided had the case been attended at an early date after its occurrence.

Case 1.—Mrs. ——, primipara, about twenty-five years old. The labour was natural, excepting that the placenta was adherent, requiring removal, which was done with some trouble. She went on well for ten days, when something came down through the vulva. The nurse called the attention of the medical attendant to the fact; but, without examining, he said it would all come right. It, however, did not cause much distress; but after a few months she began to suffer menorrhagia, which by the time she came under my care had completely blanched her. About the tenth month after delivery, she fell into the hands of another medical man, who examined her and thought it a case of polypus. He asked me to see it, and I found a body hanging from the upper part of the vagina like a polypus; but upon careful examination all around its attachments by the sound, nothing like the opening into the cervix could be found, nor, indeed, anything of the uterus above the pubis; but the cuplike condition at the position of its attachment could be felt from the exterior, showing clearly that it was the inverted uterus which was felt in the vagina. I made an attempt to reduce it, after placing the patient under chloroform. Compression of the body by the hand in the vagina combined with upward pressure, counteracted by the external support, was, after about half an hour, so far effectual as to restore the cervix, but not the body of the uterus. I then added additional force, but without result, except the production of very severe collapse, upon which the chloroform was withdrawn and the attempt given up. I then, as soon as she was recovered, passed an old-shaped stethoscope into the vagina, and placed the cupped end against the fundus uteri, the ear-end remaining outside the vulva. This end was pressed upward by a T-bandage, and removed twenty-four hours afterwards for a short time and replaced. This pressure was kept up for two days, when she was again placed under chloroform and hand-pressure employed as before. The uterus was partially, but not completely, reduced—that is to say, about half the body still remained unaltered. Again, when the pressure was fairly applied, collapse came on, which gave me great anxiety for a short time, the pulse being for some minutes nearly imperceptible. I then gave up the attempt, for the pulse had risen to 120 before giving chloroform, and the tongue had become dry. There appeared little chance of doing further good, for I employed as much force as was consistent with safety. On both the occasions she was under chloroform. However she suffered no untoward symptom from the attempts at reduction; indeed, for some time after she had less than ordinary menses, and consequently improved much in general health. I heard about a year and a half afterwards that she was in fair health.

Remarks.—There can be little doubt that if the medical attendant had examined this patient when the nurse called his attention to "something being down," the inversion would have been readily reduced. One cannot be too strict in practice in observing the rule in all cases, to fully go into all points; and this holds good particularly after delivery if anything be complained of, because nothing like a swelling can exist about the vulva without its being worthy of attention. If it be an inflamed labium, or an irritated pile, or prolapsus of the uterus, these all require attention, for they may lead to much misery, and, if neglected, will be sure to bring the medical attendant into discredit. But if it be a polypus or inverted uterus—particularly the latter—the importance of our attention is self-evident. I believe that most of our errors arise rather (now-a-days at least) not so much from ignorance as from a want of thoroughness in going into every point in a case. There is, especially after labour, a natural wish that everything should go on rightly, and there is consequently a dislike (which we all feel) to disturb this feeling. Anything being wrong half implies that we have not done our work skilfully, and we hope that all will come right in time. We shirk the inquiry which may rudely disturb our complacent feeling; but, in doing so, we but postpone the evil day. The existence of inversion is one of the last things we should wish to discover. To say that the womb is so disturbed from its natural arrangement that it will be necessary to place the patient under chloroform and perform some kind of operation, is a formidable thing to do, only ten or twelve days after labour; and yet it is better to do this than to allow the patient to go about with an inverted uterus, which is sure to give rise to symptoms requiring medical aid sooner or later.

In this case, the involution of the uterus to its natural size, and very probably the adhesion of the inverted peritoneal surfaces to one another, prevented its complete reduction, which, judging from its near accomplishment, we might fairly argue would have been easy shortly after labour.

The extreme condition of collapse is a point of importance, as it twice occurred at the critical attempt at reduction. In considering this and the next case, I am inclined to think that this mode of reduction is not so suited for chronic inversion as for the acute form. It would be best, at any rate, to try the constant pressure with the elastic bags and the pressure recommended in the next case, first of all; and, if these failed, then to give an anæsthetic and try manual pressure. I would also suggest that sulphuric æther should be employed, either alone or in combination, as having a greater tendency to stimulate the heart's action.

At present, this case has not been followed by the menorrhagia and its consequent anæmia, usually found in chronic inversion of the uterus, although before treatment she was losing greatly. For some time afterwards, the quantity was much less than normal.

Case 2 was that of a woman aged about thirty, in her third confinement. The child was delivered naturally, but the placenta required the introduction of the hand to remove it. The next day, there was retention of urine, which could only be evacuated, and that in small quantities, with very severe straining, extending over four days. At one time, no urine was passed for thirty hours. She did not, after the subsidence of this trouble, appear to have suffered; but about the tenth day she noticed that something came down to or through the vulva. Not much notice was taken of this, and she gradually got about; but, as she supposed that the womb fell, she merely put on an external support. However, at the end of three months she applied to me, without having consulted any one before about it. I found the uterus completely inverted, rather larger than the natural size, and slightly bleeding when examined.

She was taken into Guy's Hospital under my care, and, after a dose of aperient medicine, was placed under chloroform. I passed my hand into the vagina, and grasped the uterus to compress out the fluid within it. This reduced its size; and, by steady upward pressure, the inverted body passed nearly up to the level of the os. The other hand was placed externally to give support to the vagina. I was watching her condition at the time when the fullest pressure was being employed, lest any such collapse should occur as did in the last case, when I noticed her aspect staring and livid.. It was then ascertained that respiratory movements had ceased. Artificial respiration was used, and galvanism employed down the course of the phrenic nerve and from the spine to the front. After a minute or two (the exact time was not taken) she showed signs of recovery, particularly on the use of the galvanic battery; and gradually her appearance became natural. We continued artificial respiration and galvanism five or six minutes, and then waited. She, however, shortly gave signs of relapse, after which the same measures were continued, till, in about twenty minutes, she began to fairly recover. I did not attempt anything further for some hours, when two india-rubber ball pessaries were introduced into the vagina, and a pad placed externally, supported by a T-bandage. This was removed next day; and it was found that the cervical portion had become more relaxed. The same treatment was continued another day; and then, after the removal of the bags, an attempt was made, without chloroform, to complete the reduction. But, although the fundus went within the os, yet, in consequence of the pain produced and the recession of the parts, I considered it advisable to wait and to apply continuous pressure to the fundus. I therefore adapted a stethoscope, pressing the cup of the chest-end against it. The ear-end, of course, came outside the vulva; upon this a pad was placed, and the T-bandage firmly applied.

On removing the bandage, twenty-four hours afterwards, I found about two inches of the stethoscope within the uterus, firmly held by it; but by pressure with the finger on one side, and by tilting the instrument, it was removed. I found that the fundus had receded, and that the cup of the stethoscope had made its impression on the posterior wall of the uterus, giving somewhat the feeling, at first examination, that the fundus was not quite perfectly restored. However, further examination showed its true nature; and that the cavity of the uterus was forward and hollow upward, as naturally it should be. At the same time, I felt the want of an instrument which should have a convex end, instead of concave, so as to complete the reduction securely. This I have endeavoured to obtain by an easy adaptation to a stethoscope, which is described below.

A dose of ergot was given to promote the contraction of the organ, and the horizontal posture continued for about ten days. At the end of a week, the os and cervix were still somewhat open. An injection of alum-water was employed, and in a few days it was nearly natural, but with some degree of thickening and irregularity. She went out quite well. The parts contracted to nearly their original size.

The remarks made upon the last case are applicable to this. It is surprising that so little discomfort or shock was felt at the time, when we consider the formidable effects usually seen in inversion occurring suddenly immediately after labour. It is highly probable that the change took place slowly—that is, during three or four days. The treatment which was unsuccessful in the last, was successful in this case; and there seem to be two points worthy of consideration. The first is, that the effect of the air-bags in the vagina is to dilate it, and along with it the os and cervix. This is produced, probably, in part at least, by the stretching of the upper portion. This dilatation of the cervix enables the inverted body of the organ to pass into it; and then pressure of it in an upward direction stretches open the angle of flexion, and thus the way is paved for its slow restoration. As I have above remarked, attempts at sudden restitution are more likely to be unsuccessful; and I think it will be found best always to employ the air-bags for two days first, and then either to give chloroform and reduce, or to employ pressure directly to the fundus for a day. I am inclined to think, from consideration of the habits of the uterus, that the slower mode is the most certain.

I have had some bags constructed by Mr. Arnold, which I think will be more certain of producing the proper dilatation of the vagina and pressure on the fundus. The first to be introduced is a ring-shaped one, about four inches in external diameter, and its opening about two inches; the fundus uteri passing through the ring. This presses on the upper vagina equally all round, and steadies the uterus under the pressure of the second bag, which is a globular one of not too firm walls, and larger than likely to be wanted, about four inches in diameter, so that it may completely fill the whole vagina below the ring-shaped bag. This of course gives support to the first, and also presses directly on the fundus, thus preparing it for the more complete pressure to follow. A T-bandage, with pad externally, should then be applied. The apparatus for pressing on the fundus is a vulcanite stethoscope, having a pear-shaped elastic bag drawn over the thoracic end and tied round the stem tightly. Into the opening at the aural end a stopcock can be screwed, which is attached to the tube of the india-rubber spraying apparatus, by which means the bag at the other end can be distended.

To apply them to a case: The bowels having been previously opened, the ring-pessary, well greased, should be passed over the inverted uterus, and then inflated by its tube, which is then tied. The globular ball should then be introduced and inflated. A T-bandage, with a large perineal pad, must then be applied as tightly as can be borne. Twenty-four hours afterwards, these should be removed, and the vagina washed out with warm permanganate of potash lotion, or, at any rate, warm water. The bags are again introduced, and next day removed, with ablutions afterwards. The state of the uterus should then be examined—whether, indeed, it be not restored to its natural state. If it be not, then the thoracic end of the stethoscope should be pressed against the fundus as much as possible in coincidence with the axis of the organ—that is, with the stem pressed back to the posterior fourchette; a pad being placed on the ear-piece outside it. A T-bandage secures constancy of the pressure. This arrangement is removed next day; and then, if the restoration have been accomplished, the end will have entered the cavity of the uterus. But, to secure the complete restoration of every portion, inflate the ball on the end by the apparatus described. If this be left for two or three hours or more, the air can be let out, and the instrument wholly withdrawn. The distension of the ball is intended to distend the uterus enough to allow the end to be drawn out before it can again close on it. It is well to give a dose of opium every eight or twelve hours, to lessen the irritability of the uterus. A simple stethoscope will do, as this case shows; but it appears to me that a more efficient instrument would be found in the one just described.

Should one day's pressure be not sufficient, it should be continued another day more; but in that case it will be well to allow an interval of half an hour to elapse before reapplying it. If that be unsuccessful, it would be well to give chloroform, and to employ manual pressure.

Excellent hints from various authors, on the restoration of the more obstinate cases of this kind, may be found in the *Obstetrical Transactions.—British Medical Journal, Aug.* 31, 1872, *p.* 237.

89.—RACHITIS AND MINERAL INANITION.

By Dr. Blache, Paris.

Let us first revert to what has been recently demonstrated in a work by M. Dusart, "Archives Générales de Médecine et de Chirurgie," 1869-70. This author has concluded from previous labours and his own experiments:—

1. That, in all living beings, whether vegetable or animal, the presence of phosphate of lime is necessary for the transformation into cells of the azotized matters supplied by food, and that, to preserve their vitality, the tissues must be constantly traversed by a kind of current of phosphate of lime.

2. That the vital activity and temperature peculiar to each animal species is always in proportion to the quantity of phosphate of lime contained in it.

3. That when the food is found to be deficient in phosphate of lime, the tissues draw from the osseous skeleton that which is necessary for the maintenance of the integrity of the functions of nutrition, as the organism is seen to borrow from the adipose tissue the hydrocarbon elements in which it is deficient in certain cases.

Let us now examine each of these points, and see what consequences may be drawn from them in the study of the subject now before us. And, in the first place, by virtue of what action do albuminised substances assume, in presence of calcareous phosphate, the form of cells and of tissues of every nature, without, however, its being demonstrated that salt of lime forms any constituent part of them?

"Phosphate of lime," says Lehmann, "appears to be a mechanical agent of nutrition." But this term is very vague, and by no means dispels the obscurity that reigns in the mind of the reader. Knowing the property possessed by salts of lime of precipitating albumen in an insoluble state, whenever those two orders of substances are found in presence, might it not be admitted that there takes place in the organism a phenomenon analogous, with this modification—which is, however, quite natural—that in the living medium this precipitate assumes the figured form and becomes organized in tissues?

This interpretation will appear less hazardous if it is borne in mind that, in the muscles, the proteinous substances present themselves in two different physical states: the liquid form preserving the name of albumen, easily assimilable, soluble in water, and containing only alkaline salts; and the solid form under the name of fibres of different kinds, offering a greater resistance to the action of the digestive agents, and containing almost the whole of the calcareous salts.

From this it may easily be understood that if children too young or persons debilitated from different causes are subjected to a course of alimentation exclusively composed of the flesh of young animals (Guérin's experiments), the liquid albumen will be easily absorbed, whilst the solid parts containing the salts of lime will resist the action of the debilitated stomach and will be ejected.

It is, therefore, not organizable elements which are wanting, but an organizing agent, and mineral inanition ensues indirectly as surely as by administering aliments deficient in salts of lime, such, for instance, as wheat alone.

We have said that the vital activity of animals, and their peculiar temperature, are always in proportion to the quantity of phosphate of lime they contain: now, in the physiological experiments that I followed out with M. Dusart, when animals were deprived of phosphate of lime, this privation was attended with a sudden loss of appetite, accompanied with sadness, depression and immobility, as infallibly as the contrary phenomena were produced, in the course of a few days, by administering calcareous salt.

The symptoms thus observed have the greatest affinity with those which mark incipient rachitis, and those periods of adolescence during which, after a rapid stage of growth, the organism, exhausted by the efforts it has just made, and incapable of sustaining it any longer, seems to give way, and reveals a suspension of all the acts of nutrition, and a general atony by which the patient is affected morally as well as physically.

We have then, as in rachitis, pains penetrating the limbs and articulations, complete anorexy, fatigue and difficulty in breathing after the least exercise. This state also reminds us of that of a great number of women during their pregnancy, and of that of most convalescents when the agents of nutrition are slow in resuming their functions.

To explain the gravity of osseous injuries, we have said that the tissues subjected to mineral inanition draw from the skeleton as from a common reservoir the phosphate that is necessary to them. We justify this assertion by the fact, that in the animals on which we made experiments, we found, at the end of three months, that the bones had become friable and had lost two-thirds of their weight.

Now it is known that in a normal state the osseous tissue requires several years for its renewal; if, therefore, it had undergone only a mere stoppage of nutrition, ejecting the worn out elements and receiving no fresh ones, it would have lost but a slight part of its substance. Such is not the case, and we do not see that any other explanation could be given of this apparent anomaly.

But how is it that mineral inanition, whether artificially produced in animals or whether it is the consequence of different morbid causes, is manifested by lesions which vary in their characteristics?

A complete answer appears to us to be contained in the consideration of the age of the subjects attacked. If, in fact, vicious alimentation exerts its action on children too young, the invariable presence of ill-digested substances in the intestine will soon produce enteritis and all its consequences; whilst the bones will undergo a shock, the more destructive as they are struck in the midst of the intensest movement of organization. Then follow the thickening of the periosteum, with vascularisation, effusion of blood under the periosteum, and in the bony texture itself.

The latter, mortally injured and struck with a kind of molecular necrosis, is divested at once of its mineral and organic principles, and the phosphates subjected to the destructive influence are abundantly eliminated through the kidneys.

In vain are new tissues formed in the bone to replace those struck with inflammation; they remain in a spongoid or fibrous state till the progress of age or a judicious regimen admits of the introduction of fresh salts, susceptible of organization.

If, on the contrary, the morbid cause attacks subjects having already attained a somewhat advanced degree of development, if the osseous system, having acquired its normal consistence, now presents only the movement of nutrition necessary for the regular renewal of its different parts, the perturbation will be less, and, though the osseous tissue will be singularly rarefied, we shall discover friability, but no inflammatory phenomena with mollities, except in very rare examples of osteomalacy, mostly occurring in very peculiar cases of late or multiplied pregnancies and under hereditary influence.

In conclusion, let us mention that from the very beginning of the pregnancy, the phosphate of lime disappears from the urine.

The salt is condensed throughout the organism with a view to the future development of the embryo, in the form of a thickening of the bones, and even of concretions, called by Follier osteophytes, which, far from being, as certain authors have believed, the result of an aberration of nutrition, ought, in our opinion, to be considered only as reserves destined to meet the extraordinary consumption caused by the rapid growth of the fœtus towards the last months of the pregnancy, In fact, it is at that period that the osteophytes begin to diminish; to disappear completely only when they have supplied the milk, during the first months after the delivery, with the mineral elements with which it is abundantly provided at that period, and which are necessary for the sustenance of the infant.

Finally, if all these perturbations proceed from one and the same cause, solely arising from mineral inanition, to remove them it must only require the introduction into the organism, directly or indirectly, of the salts in which it is deficient.

We are of opinion that the success attending the use of cod-liver oil is owing to no other cause. Let us remark that, to produce such satisfactory results, it is sufficient to administer it only in feeble doses, fifteen grammes a day, for instance, the greater part of which does not pass through the digestive tube, and is to be found again in the stools without having been digested. It will be easily admitted that the oil does not act as food in such circumstances. We must then seek elsewhere the cause of its efficacy. As for us, we believe that it wholly proceeds from the exciting action produced through the whole extent of the digestive tube by the volatile oily acids to which it owes its well-known odour. Then reappear the regular contractions of the digestive tube, and especially the glandular secretions. This double influence promotes the digestion of the solid parts of food which had, till then, resisted, and carry along with them the salts of lime with which they are impregnated.

The same result is obtained, and our practice for several years past is a sure guarantee of the fact, by presenting directly to the absorption of the stomach phosphate of lime; on the condition, however, that the latter be soluble and require of the economy no labour for its digestion and assimilation.

We lay great stress on this point, for before us, many physicians, without, however, suspecting the general action of phosphate of lime, had made a trial of it on patients with the sole view of obtaining a restoration of the bones; but the constant failure of these attempts had produced such discouragement that all had given it up, to such a degree that, if there are some who in a commonplace way advise the use of it, others formally reject it as useless, whilst a certain number, and among the most modern, never pronounce the name, even relatively to the treatment of fractures and of rachitis.

To discover the reason of this conduct, M. Dusart made on healthy dogs, provided with gastric fistulas, a series of observations on the digestion of the phosphates in use till then. He ascertained that, after long labour of the stomach, an infinitely small part was dissolved by the lactic acid, whilst the rest—that is to say, nearly the whole—passed without being digested, but only disaggregated into an impalpable power in the intestine, where its most ordinary effect was to produce an obstinate constipation.

It may, therefore, be easily conceived that the phosphate taken into the weakened stomach of persons afflicted with rachitis will undergo no modification, and remain absolutely inert.

Then, imitating the action of the gastric juice on phosphates, M. Dusart prepared a body to which he gave the name of lacto-phosphate of lime, containing the salt completely digested, and, consequently, capable of being absorbed without requiring any previous labour of the stomach, as he easily ascertained with the dogs already mentioned.

It is this compound that was employed in the comparative experiments made on animals, and that we have made use of in our clinical researches.

This product is now known to most French physicians by the names of Dusart's Lacto-Phosphate of Lime Syrup and Wine.

The large dose of medicine contained in these preparations—a gramme of lacto-phosphate to each tablespoonful of syrup, and to each glass of wine—explains how, under its influence, patients are conscious, in a few days, of a return of appetite and of activity in all the functions of nutrition, forerunners of a permanent cure.—*Practitioner*, *Sept.* 1872, *p.* 149.

90.—ON THE PHYSIOLOGICAL DYSPEPSIA FOR STARCHY FOOD IN INFANCY.

By Dr. Prospero Sonsino, Pisa, Editor of the Medical Newspaper the "*Imparziale*," of Florence.

[There are certain conditions the absence of which, in the digestive system of early life, render it unfit to digest the aliments which are subsequently utilized. For instance, a young herbivorous animal lives upon its mother's milk, an animal product, and is unable to digest the vegetables upon which it will in after life be nourished.]

As the process of digestion consists essentially in the action exerted upon the aliments by different fluids which are poured into the alimentary canal; in order to obtain a good explanation of the question, it is necessary to inquire if there are any differences in the action of digestive juices in early life, compared with the adult age, and then to discover upon what materials of the aliments those differences act effectively.

If we examine the composition of milk, the proper food of the new-born and young infant, which with reason we may retain as the prototype of the complete aliments, we find in it, besides water and salts, the three organic groups of alimentary principles which concur in different manner to sustain the process of nutrition, viz., the group of albuminoid or *nitrogenized* principles—that of *fatty* principles; and that of hydrocarbonaceous principles. But it is remarkable that the latter are exclusively represented by a kind of sugar called *lactin*, which, with an insignificant modification, being converted into *glucose*, is rendered diffusible—a substance which could almost be called a true nutriment in the signification given to this word by Corvisart; whereas the starchy principle, which is a conspicuous ingredient of the diet of the adult, and which needs an elaborated process of digestion to be converted into glucose, the material fit for absorption and diffusion, is not at all present in *any* milk. This circumstance of the composition of milk induces us to put the question, "*Is the easiness of digestion of milk in early life to be attributed to its being deprived of starchy principle?*" or, in other words, "*Is it the inaptitude to digest the starchy matter which in early life interferes with the complete digestion of all the aliments which include that material?*"

If we have good reasons to reply affirmatively to this question, then it will follow that in infants there is what we may call a *physiological dyspepsia to starchy matters*, to which ought to be referred much, if not all, the difficulty in the choice of the convenient food for infants.

Let us see what is the principal difference of composition between animal food and vegetable food. Partly, that in the latter we find more materials refractory to any digestion; that in consequence a more elaborate power of digestion is needed to obtain the nutriment from it. We find in the one and in the other, albuminous principles, fatty principles, saccharaceous principles; whereas *only starchy principles*, which constitute the principal ingredient of vegetable food, are not at all present in animal food, be it meat or any other tissue, or a product of the animal, as milk or eggs.

Therefore, the same physiological and anatomical arrangement that in infants gives evidence of its being not prepared for vegetable food, supports the conclusion that starchy matters cannot be well digested in infancy, and that there is really in infancy what may be called *a physiological dyspepsia for starchy aliments.*

Bidder and Schmidt found, on examining the power of saliva to convert starchy matter into glucose, that in some new-born animals that property is defective. The same physiologists collected some saliva of an infant four months and a half old, and found that this fluid converted the glue of starch into glucose with great difficulty and very slowly. Prof. Schiff, in his lectures on the physiology of digestion, says that the active principle of saliva appears in man only at the age of the first dentition, and confirms all the results obtained by Bidder, who was the first to make researches on this subject.

But saliva is not the only digestive fluid which assists in the digestion of starchy matter. Pancreatic juice and enteric juice also take part in it. As far as I know, no one has made any researches with the view of establishing whether or not these latter juices possess in new-born animals the same digestive power over starchy matter as in the adult animal. The performance of such researches on pancreatic and enteric juices is really more difficult than that concerning saliva, inasmuch as these juices are poured into the digestive canal, and we cannot therefore collect them in man as we can do with saliva. Thus the direct examination of the same juices can be instituted only in *animals.* But in the same manner as physiologists have established the general digestive property of pancreatic and enteric juices, especially by experiments on *animals*, it appeared to me feasible to elucidate the function of digestion in early life by analogous experiments *on very young animals.*

In making such researches I had the opportunity of availing myself of the advice and co-operation of my friend, the well-known physiologist, Prof. Schiff, who put at my disposal all the means offered by the laboratory in the Museum of Florence.

Prof. Schiff had long before instituted a large number of researches on the action of pancreatic juice in the digestion of adult animals. We had then to repeat them, as far as possible, in the same manner on young and sucking animals, to give them a value for comparison between the digestion of the young and of the adult.

But to estimate the digestive action of pancreatic juice on starch in very young animals, we could not have recourse to the method of obtaining the pancreatic juice by a pancreatic fistula, as the smallness of the viscus in young animals renders the latter impracticable. We had, therefore, recourse to another expedient, which in the young, as in the adult, could be practicable with the same good result.

The process of experiment is the following :—After having killed the animal, the pancreas is immediately drawn forth, and being isolated, it is hashed and reduced to the consistence of pap. This is put in sufficient distilled water, and thus there is obtained a pancreatic infusion which is endowed with the same digestive powers as the pancreatic juice. If we pour some drops of this *fresh* infusion on some glue of starch, and afterwards apply to the mixture Trommer's test, we shall have evidence whether the transformation of starch into glucose has taken place, and therefore whether the pancreas of young animals possesses or not the digestive action on that material as it does in the adult.

We made the experiments with the pancreatic infusion of five sucking animals, *i.e.*, a little dog, five days old ; another dog, fourteen days old ; a cat, seven days old ; and two rabbits, seven days old. The result was, that the fresh pancreatic emulsion of all these animals was incapable of transforming starch into glucose, *even after a long contact*, whereas the same *fresh* pancreatic emulsion of *adult animals* produces the transformation in a very short time indeed, *almost immediately.*

I think it very important to rigorously establish this condition of *physiological dyspepsia* in infants, which perhaps in the very young reaches absolutely the degree of *apepsia*, inasmuch as the tendency, not only of the public, but also among the generality of practitioners, is too favourable to feed infants with starchy matters. In fact, the preference given to starchy articles of food by mothers when they wish to add something else to the nutriment offered by the milk, or altogether to wean the infant, is notorious ; and we find in many countries, at the present day as well as in the past, the common pap, or, what is still more dangerous, rice, arrowroot, or tapioca, which contain a larger quantity of starch than bread, united with the normal aliment of the sucking child ;

and still worse, this is usually done more frequently, and with more persistence, when the infants do not thrive and when they are sick, *i.e.*, when the digestive power is probably more defective than in healthy infants.

The trials of administering food previously artificially digested both by gastric and pancreatic juices, in cases of infantile atrophy, are suggested in Routh's book already quoted. This author hints at the convenience of mixing with the food the pancreatic juice, particularly for converting starchy materials into glucose; but he adds: "Unfortunately, however, we have not yet accurate knowledge enough to prepare this artificial juice." And then adds: "It is to be hoped, however, the desideratum being known, that some means may be devised by which it may be procured, so as to admit of convenient employment in cases like those under consideration."

Now, there is no longer any difficulty in satisfying this desideratum. It is known, in fact, that the infusion of fresh pancreas acts like the pancreatic juice itself, and that if we obtain an infusion of pancreas in glycerine instead of water, we have a good manner of preserving it as long. Leube, who recently made some trials of feeding by the rectum, found that glycerine extract of pancreas is quite equal in its digestive power to the fresh pancreas, and will remain good for several weeks. The extract must be prepared with the pancreas of a bullock, which is finely chopped and rubbed with 250 grammes of glycerine. Thus, I think that we must try this new experiment to render digestible starchy matter in infancy.

But now a new question may arise about starchy aliments. Is the danger from them, in infancy, to be referred only to their indigestibility, or also to their affording insufficient materials for the sanguine process of assimilation, and to the feeble infantile process of hematosis to reduce them conveniently for the ends of nutrition? If the second proposition is true, any expedient contrived with the view of enabling the alimentary canal to absorb starchy materials would be useless, the best thing being in that case to exclude them altogether from the food of infants. On this point it must be recollected that before the indigestibility of starch was hinted at, the danger of feeding the infant with it was attributed to its insufficiency for repairing the waste of the organism, and in this manner were explained all the disorders which arise from that manner of diet, to which was referred also the origin of rickets (Magendie among others).

Good reasons, however, make us now believe that really it is not convenient to feed infants with copious starchy matters, however these may be rendered digestible. These reasons are, that the nutriment furnished by starch does not afford materials for the re-integration of the principal tissues, but it concurs almost exclusively as fuel to the process of hematosis, whereas the growing infantile organism needs a greater quantity of those nutriments which afford directly materials to the development of the tissues than of the other, which must be consumed in the process of hematosis. There is, moreover, reason to suspect that this function is in a certain degree defective in the infantile organism, and therefore that it is better accomplished with fatty matters than with starchy matters, the former being more advanced than the latter in their degree of oxidation.—*Practitioner, Sept.* 1872, *p.* 155.

91.—THE USE OF PANCREATIC EMULSION IN THE WASTING DISEASES OF CHILDREN.

By Dr. Dobell, Senior Physician to the Royal Hospital for Diseases of the Chest.

[In 1871 Dr. Dobell intended to prepare an article for publication, "On the Use of Pancreatic Emulsion in Tabes Mesenterica." He however gave up the idea on account of the difficulty of proving in the cases which recovered that the mesenteric glands had been the seat of disease.]

In this paper I propose to drop the question of disease of the mesenteric glands, and simply to speak of the class of cases constituting that wretched form of "atrophy and debility" and "marasmus" in children, in which every part of the body wastes away except the abdomen; the state described by Dr. Druitt, in the last edition of his *Vade Mecum*, in the following few and graphic words:—"Emaciation and voracity; the belly swelled and hard; the skin dry and harsh; the eyes red; the tongue strawberry-coloured; the breath foul; the stools clay-coloured and offensive, sometimes costive, sometimes extremely relaxed; the patient usually dies hectic" (p. 75).

I wish to bring prominently forward the fact that this state, provided there is no advanced lung disease, is rapidly cured by pancreatic emulsion given in doses of a teaspoonful every four hours, and regularly persisted in till fat and flesh are restored. It is, of course, necessary that a proper diet should be insisted on at the same time; but proper diet without the pancreatic emulsion will not do. This I have found over and over again in cases where everything judicious in the way of feeding and cod-oil had been carefully and perseveringly tried without avail, but which, on the addition of the emulsion to the previous diet, began at once to improve.

This fact has been familiar to me for a long time; and considering how largely pancreatic emulsion is now used in the wasting diseases of adults, I am surprised to find that it is not even referred to in the latest works on the diseases of children. Looking through these works and examining their indexes, one is led to the conclusion that their authors are not aware that there is such an organ as the pancreas, or that pancreatic juice has ever been used in any form in the treatment of disease. Yet scarcely a week now passes but some general practitioner relates to me cases of the successful use in his own practice of pancreatic emulsion in the wasting of delicate children; showing that in this respect the rank and file of our professional army are in advance of some of their generals, which ought not to be the case.

Dr. Prospero Sonsino's paper will, I hope, excite more general attention to this important subject. He, however, has laid all the stress of his observations upon the influence of the salivary and pancreatic juices on the digestion of *starch*. This is unquestionably a point of the greatest importance in the case of very young children brought up by hand, as showing the absurdity of attempting to nourish them upon starchy food, not artificially digested, before the period of life at which the saliva and pancreatic juice attain their functional activity. And even then, as Dr. Sonsino afterwards remarks, "good reasons make us now believe that really it is not proper to feed infants with copious starchy matters, however these may be rendered digestible." The principal results of Dr. Sonsino's investigations are summed up in the two following conclusions, which, however, are not new:—1. "Pancreatic juice in dogs, cats, and rabbits, in the first week of life—perhaps for some days more—is devoid of any digestive action on starch." 2. "In the early life of man, probably till the beginning of dentition, infants offer a true physiological dyspepsia for starchy aliments, caused by the inactivity of one at least—possibly of all—the humours that concur in the digestion of those aliments" (saliva, gastric juice, pancreatic juice, enteric juice).

No doubt, when wasting occurs in these early periods of life, it is very often due to foolish attempts to nourish children upon farinaceous foods, by which dyspepsia and diarrhœa add to the exhaustion of partial assimilative starvation. But, as a matter of fact, farinaceous food is seldom depended upon without some addition of cow's milk or some assistance from lactation; and we see children suffer from wasting who are fed entirely upon cow's milk or nursed by their mothers, and in such cases the "physiological dyspepsia for starchy food" will not account for their decline. Therefore we must not forget, that although normal saliva only acts upon starch, normal pancreatic juice acts also upon fats; and it is probable that these two functions of the pancreas are sufficiently independent of each other that they may exist separately. This I pointed out in my paper to the Royal Society in 1868, "On the Special Action of the Pancreas on Fat and Starch" (Proc. Royal Soc. No. 97). It is there stated as the results of my experiments, that "in addition to the influence of the pancreas upon fat, it has the power of converting starch into glucose by simple mixture. This property remains to a certain extent *after the pancreas has ex-*

hausted its property of acting upon fat. The quantity of pancreas which before mixture with fat will convert about eight parts of starch into glucose, after saturation with fat will still convert about two parts of starch into glucose." It is possible, therefore, that in different states of depraved health one or other of these properties of the pancreatic juice—that for the digestion of starch or that for the digestion of fat—may be deficient. And thus the depraved nutrition due to such deficiency will not be limited to the period of life anterior to that at which, under normal conditions, the proper functions of the pancreas should be developed. It is evident that when the power of digesting fat fails to be developed at its proper time, the defect must tell with double force upon children already suffering from deficient digestion of starch.

The children who become the subjects of this kind of wasting of which I am now treating are especially (1) those who are sucked by mothers whose milk, though abundant in quantity, is extremely deficient in nutritive properties; (2) those who are brought up by hand; and (3) those who, at a later period of childhood, have been subjected to similar chronic defects in diet. Now, it is especially when the mother's milk is poor in fat and lactin that the child becomes "dissatisfied," and "craving," and in the majority of cases it is this which first leads to the introduction of farinaceous food, under the popular nursery belief that it is "*satisfying;*" and, as Dr. Sonsino states, if this is given before the power of digesting starch is established, of course nothing but mischief can result.

But organs, like individuals, do not rise to the full performance of their duties unless called upon by the necessity for their activity; and, as I pointed out in 1866 (*On Tuberculosis*, p. 40, second edition), "As the mother is deprived of fat elements by lactation, so is the child deprived of them by a persistence in a diet deficient in milk. In the case of the child thus deprived of fat, a double injury is done—first by cutting off the supply of fat elements necessary for the protection of the tissues; and secondly, *by paralysing the function of the pancreas by prolonged inactivity.*" I venture to think that this is a point deserving of far more attention than it has yet received. It accounts in a great measure for the impossibility of restoring these ill-nourished wasted children by any kind of *natural* diet after they have been allowed to remain in a chronic state of defective nutrition. A child that has been long fed upon diet deficient in fat fails to develop the fat-digesting properties of the pancreatic secretion, and thus, when proper food is at last presented, cannot make use of it for nutrition.

It is probable, therefore, that it is due to this conjunction of circumstances that these wretched cases of fatal infantile wasting occur;—the food deficient in fat not only fails to nourish the child, but fails to develop the function of the pancreas for the digestion of fat at a later period of life; the craving of the child due to the deficiency of assimilated fat is met by starchy food which it has not the power to digest, and which if digested cannot supply the place of fat. Thus it is literally starved from first to last of those elements of nutrition especially essential in early life. We cannot, therefore, be surprised that such cases have proved obstinately fatal, neither is it anything but what one might expect, *à priori*, that they get rapidly well when pancreatic emulsion of fat is added to their diet, for by this means they are enabled to assimilate both fat and starch.

I have proved over and over again that, whether in children or adults, no amount of milk or cream, however good, will do instead of pancreatic emulsion; and I have tried to discover why this should be. Milk, so far as this part of its composition is concerned, is simply an emulsion of fat; and pancreatic emulsion, as I have shown, in the paper to the Royal Society already referred to, is not, as formerly supposed, a chemical combination, but a true emulsion. Why, then, does not milk answer as well? I believe the explanation to be very simple, and that it turns upon the following points:—

1. The fineness of the particles of fat.
2. The permanent character of the molecular mixture of fat and water.
3. The proportion of fats having high melting points.

(*a*) In my first paper on Pancreatic Emulsion, *Lancet*, (September 10, 1864), I gave the measurements (made by the late Mr. Farrants, president of the Microscopical Society) of the particles of fat in cod-oil and beef-fat emulsions, as then prepared for me; showing that the majority of the particles in the cod-oil emulsion ranged from the 16,000th to the 1,200th of an inch in diameter, and those in the beef-fat emulsion from the 10,000th to the 2,500th of an inch; and, according to Bowman (*Practical Handbook of Medical Chemistry*, p. 174), "The size of the globules in healthy milk varies from a mere point to about the 2,000th of an inch."

Since I published Mr. Farrants' measurements, pancreatic emulsion has been made by a much more equal and satisfactory process than at that time, and I have just examined a chance specimen procured from Messrs. Savory and Moore, in which the large majority of the particles of fat range from the 21,600th to 14,400th of an inch in diameter, the prevailing size being the 18,000th of an inch; while in a specimen of good new milk (cold), which I have also just examined, the large majority of the particles of fat range from the 7,200th to the 3,600th of an inch in diameter, the smallest being the 10,800th.

(*b*) The permanent character of the pancreatic emulsion is very remarkable, far exceeding that of milk. It "differs entirely from all other kinds of emulsion of fatty matter, whether chemical or mechanical. All other emulsions of fat are destroyed by ether, the fat being restored at once to its original condition. The influence exerted by the pancreas upon fats, therefore, appears to operate by breaking up the aggregation of the crystals of the fat. It alters the molecular condition of the fat, mingling it with water in such a way that even ether cannot separate the fat from the water. A *permanent emulsion* is thus formed ready to mix with a larger quantity of water whenever it may be added." (Proceedings of the Royal Society, already referred to.)

(*c*) In the *Chemical News*, September 4, 1868, I have stated my reasons for believing in the importance of fats of high melting points, such as stearine, margarine, and palmatine, over those of low melting points, such as olein, as elements of food and medicine; although further experiments and investigations are still needed on this interesting subject.

Pancreatic emulsion of solid fat, consisting principally of stearine, margarine, and palmatine, is therefore quite a different thing from milk, the fat of which is principally olein.

Now, the nearest approach to a pancreatic emulsion is what may be called *nascent milk*, by which I mean milk just secreted—milk that flows from the mammary gland as it is formed, or, as mothers term it, "as the draught comes in." In this the emulsification is finest and most perfect, but every minute that elapses after the milk is secreted deteriorates this perfection of emulsification, until, as we know, whether retained in the lactiferous ducts or in an artificial vessel, but especially in the latter, and when allowed to cool, the cream separates from the water of the milk, never again to be susceptible of the same emulsification with water in which it first existed, *except under the influence of pancreatic juice.*

I submit that this is the secret of the superiority of lactation, and especially of lactation at the time "the draught comes in," over every other kind of infant-feeding, whether in man or in the lower animals. It forms an important distinction between milk-diet supplied by the natural process of suckling, and milk-diet administered artificially, and affords some reasonable colour to the old-standing belief in the efficacy of "new milk warm from the cow" for delicate children, and to the remarkable recoveries recorded in ancient times of old persons nourished by lactation when everything else had failed.

The Author will be much obliged to any of his readers who will favour him with their clinical experience on the subject of this paper.—*Practitioner, Oct.*, 1872, *p.* 234.

92.—ON INFANTILE PARALYSIS AND ITS RESULTING DEFORMITIES.

By Richard Barwell, Esq., Surgeon to Charing-Cross Hospital.

[There is no doubt that infantile paralysis in its early stages is curable by the two forms of galvanism. Unfortunately, however, we frequently do not see the cases until too far advanced to be amenable to this treatment.]

Being strongly convinced of the peripheral origin of infantile paralysis properly so called, yet finding that in cases of some little standing no progress was effected by galvanism, neither was the internal use of strychnine followed by any benefit, I determined to employ the drug locally. For this purpose I injected into the moveless muscles or their neighbourhood the Pharmacopœial solution of strychnia. Here, too, I was disappointed; the topical effects were nil, even while on the verge of constitutional symptoms. It appeared to me that I must retard absorption, and thus while keeping the drug longer in the part to be influenced, avoid its action on nerve centres. I therefore procured a very dense solution—viz., two per cent.,—and began a series of cautious experiments. I used a syringe with a piston graduated into half-minims, over which runs a screw stop; each turn and a half of the screw corresponds to a half-minim, hence each such quantity can easily be divided into six parts, and, with more care, into twelve; as each half-minim of solution contains $\frac{1}{100}$ gr., subdivision is rendered easy and all precautions facile. In my experiments, however, I very soon discovered that, thus largely dissolved, strychnine might be safely injected in much larger quantities than had been imagined, and that I could fearlessly begin by giving even children five times the dose hitherto considered as the maximum—namely, five half-minims, or one-twentieth of a grain. But it was not alone with children that I thus worked: all local paralyses appeared to me proper subjects for these experiments. The results are singularly confirmatory of the idea which I had formed, that eccentric paralyses would be very amenable to the local action of strychnine. Thus, several cases of facial paralysis, several of paralysis of the wrist (independent of syphilis or of lead poisoning), and others, have yielded to a few injections, after months of galvanism, internal administration of strychnine, and other remedies have failed. Several of these cases have been published; here I will give only two short *résumés* in illustration of the power of the drug thus employed.

J. G. M——, aged thirty-eight, consulted me on the 14th of January, 1872, on account of lameness from paralysis in both legs. In the early part of 1865 he had, at Malta, Mediterranean fever, which appears to be a variety of gastric fever. This was followed by acute rheumatism without heart affection. The recovery was slow, with many relapses. He does not know what muscles or limbs may have been paralysed when he was in bed; but when he began to get about, all the muscles in front of the tibiæ and all those in the ball of the thumb had lost power, except those inside the long flexor tendon, and even these were very much weakened. General wasting also of these muscles had taken place. His gait was very awkward and insecure; and he came to ask me about the desirability of instruments to assist him in walking, having found galvanism almost constantly employed utterly useless.

I explained the above-described use of strychnine, and proposed that it should at all events have a trial. He consented, and I began with the right leg, which was rather less wasted than the other. The dates and quantities of injection were as follows:—Jan. 14th, seven half-minims; 17th, eight; 19th, ten; 21st, twelve half-minims. From the time of the first injection the limb began to improve, both in power and in size. I then took the left leg—the more wasted of the two; but as the last injection had caused a slight sense of uneasiness I used a less quantity—namely, on Jan. 24th, eight half-minims; 26th, eight; 29th, eight; 31st, eight; Feb. 2nd, ten; 5th, ten half-minims.

In equal degree with the restoration to shape did voluntary power return. The limbs are not yet as strong as normal members, but this is a mere matter of time.

M. E. B——, aged forty, came under my care on the 17th of October, 1872, with paralysis of the right side of the face. On the 31st of August she, in washing her face, put her finger twice into the right eye. To this she attributes the paralysis; it was doubtless a consequence. In the evening her husband saw the "mouth go round." She has been since the 1st September under treatment, taking tonics and strychnia, and using galvanism.

Oct. 17th. The right side of the face is perfectly immobile; the mouth much drawn to the left; the right eye wide open. I tested the irritability of the muscles with a rather sharp galvanic current. There was some action in the platysma, but nowhere else. I injected seven half-minims of the 2 per cent. solution of strychnia; no constitutional effects.

27th. This patient remained away ten days, as she was afraid of what she called "the operation." To-day, however, I found improvement, which she said had immediately followed the injection, but had not continued after the first three days; hence she returned, and I injected eight half-minims. On Oct. 29th I injected ten half-minims, on Nov. 1st, ten; Nov. 3rd, ten; on Nov. 5th, twelve; and on Nov. 7th, twelve.

I have noted here nothing beyond the mere injections, as steady improvement is the history of the case. After ten injections she was quite well, the mouth remained straight, and she could close the eyes perfectly. I saw her only a week or two ago, and she remained quite well.

It is to be observed that in this and in other cases of adult eccentric paralysis voluntary motion has been perfectly restored, while galvanic irritability has remained absent for a considerable time. In other cases a response to the continuous current has early arisen, but only after voluntary movement became markedly improved. The behaviour of infantile paralysis is herein different, and responses to the electrical current from one or the other apparatus precedes any return to voluntary movement; but this also comes after a little while. My method of proceeding with infants is as follows: To begin by galvanising each muscle separately, and to note the amount (if any) of electric irritability, or its entire absence. The former organs may almost take care of themselves, a little galvanism being passed through them occasionally. The others should be galvanised two or three times, and closely watched to detect any sign of twitching. Now during all this time it is most essential not to frighten the child, or give more pain than necessary. It is impossible to make much out about the paralysed muscles of a limb while the part is being jerked from above by violent movements of the trunk. Although we do not expect electric mobility to come into the muscles which have long been paralysed, it is well thoroughly to test them. And now, having determined to use strychnia, I begin with from three to six half-minims, according to my patient's age; and, selecting an opponent to that muscle which is most contracted, I inject the solution into its substance, or sometimes over the place of entry of its nerve. I continue such injections two or three times a week for a certain period, and then try the muscles again. They nearly always respond first to the constant current, and usually soon after this a small amount of voluntary power becomes perceptible. The injections must not be discontinued as soon as the galvanic or nerve irritability is established; brisk response to the former should at least be secured.

L. C——, aged six years and six months, was paralysed in the left leg sixteen months ago, there having been neither previously nor afterwards any severe illness. For the first ten months nothing was done except tonics and occasional rubbing. During the last six months galvanism and the internal use of strychnia have both been extensively used; indeed, on one occasion the drug was pushed so far as to produce tetanic spasms.

She came to me on the 6th June, 1870. The left leg was shrivelled and utterly useless. When she was supported by her nurse on the sound leg, the other hung impotently down. By a peculiar jerk of the body, common to all these children, she could make it swing; and the psoas being intact, or nearly so, enabled her to hitch it a little forward. The limb was always cold—blue in places, pink in others. The muscles were so wasted that the limb looked barely thicker than the bone should be. There was no response to even strong galvanic currents. Three minims of strychnine solution were injected.

I injected this child with strychnia twice a week for three months before I got any response to galvanism. When the response began I left off the injections and the irritability decreased markedly. I then, in October, recommenced the use of strychnia, combining it with galvanism, and this treatment was continued for five months. In March, 1871, I discontinued the injection. Considerable voluntary irritability of muscles had now been established, and very easy responses to the continued current. In May, the induced current began to tell. The rest of the case is a mere question of time. The patient is still improving rapidly.

J. R., aged seven years and three months, was brought to me on February 3rd, 1871, with a deformity of the right foot, which I have named *pes cavus*, arising, as I have shown, from paralysis of the gastrocnemius, and frequently also of the muscles in front of the tibia. These paralyses were present in this case. The leg was a good deal wasted, but not livid. It easily lost temperature on cold days, but if kept well covered remained warm. The paralysis came on when she was two years old without illness of any sort; the deformity formed itself gradually. She has been treated, among other methods, with galvanism and internal doses of strychnine.

I injected five half-minims to begin with, and twice a week I continued this method, increasing to eight half-minims. At the end of seven weeks the muscles became amenable to the continued current. The use of galvanism was combined with the injection. At that time, viz., three lunar months—the muscles were voluntarily mobile, and the size of the leg was very much increased. The child walked very fairly well. The deformity was treated in a manner to be described in the sequel.

These two cases mark strongly a difference to be found in paralysed limbs—a difference which is of the very greatest value for prognostic purposes. In the one the extreme wasting and the great loss of temperature marked almost the utmost limit of nutritive disorder; in the other, although paralysis had lasted as long, or even longer, and though the limb was greatly wasted, yet the skin was not so cold nor so livid; the muscles gave, when pinched, some idea of resiliency, and were not like either soft paste in a sausage skin, or like bundles of cord, as in the former case. Now in these less livid cases, as it is certain that muscular degeneration has not gone so far, the chances of recovery within a moderate time are very considerable, however long the malady may have lasted. Of the other class I would speak with all caution. I have met with other cases besides that of L. C—— just quoted, which leads me to believe them curable, if sufficient care be employed for a long period. But we have to do not merely with malady. Three other conditions may, and do, often interfere—viz., convenience, patience, and money—to one or the other, sometimes to all of these, the best devised therapeutics will be forced to yield.—*Lancet*, *July* 6, 1872, *p.* 2.

93.—A CASE OF SPINA BIFIDA CURED BY INJECTION.

By Dr. JAMES MORTON, Surgeon and Clinical Lecturer, Glasgow Royal Infirmary.

John Kelly, aged two months, was admitted into ward 17 of the Glasgow Royal Infirmary, on October 2nd, 1871. This child had a tumour opposite the upper lumbar vertebræ, globular in shape, of about the size of a small orange, and presenting the usual appearances of a case of spina bifida. Its covering was thin, so that it was quite translucent; and at the child's birth it was about half its present size. The mother stated that the tumour felt harder and fuller when the child cried. Moderate pressure upon it did not cause much inconvenience or suffering; and the child had never had convulsions, and seemed in all other respects quite healthy; the fontanelles being neither more open nor more full than usual at the same age.

On October 12th, the tumour was punctured with a grooved needle, and rather more than half of its contents—a pale straw-coloured fluid—was removed. It was then covered with lint dipped in oil, and over this cotton-wool; and, to fix the whole and afford a slight pressure, a broad elastic band was passed round the waist of the child. The sac speedily refilled, and on the 18th was punctured a second time; and again it refilled.

On October 24th, the tumour had regained nearly its former size; and to-day it was punctured with a trocar and cannula of moderate size. After it had been half-emptied, a small portion—probably nearly half a drachm—of the following solution was injected: ℞. Iodi gr. x; potass. iodidi ʒ ss; glycerini ℥i.

On October 26th, the child continued well, having no bad symptoms, and being only a little "fractious." In the swelling, a portion of a soft solid substance could be felt, rather to one side.

On November 2nd, the mother was allowed to take the child home for a day or two; and on the 6th she returned to the Infirmary, when it was evident that some degree of refilling had taken place. The tumour was again injected with a small portion of the same solution. How much actually entered the sac, it was not possible to say. The child, however, continued quite as well as before; and, on November 23rd, he was brought up and shown to the clinical class, when the tumour was found to be smaller and harder than formerly, without any appearance of re-distension with fluid.

On December 7th, the child was again shown at the hospital; and now the swelling presented the appearance of a shrivelled bag of skin, darker in colour than the adjacent integument, somewhat resembling a corrugated scrotum, and affording reason to believe that there was now complete closure of the opening in the spinal membranes. The health of the child was perfect, his mother affirming that he never was so well and comfortable as he was now.

On January 8th, 1872, the child was again brought to the hospital, merely to show that he continued quite well.

Remarks.—In commenting on this case before the clinical class, a short account was given of the usual appearances presented by such tumours, and the ordinary coverings and contents were noted. Reference was also made to the deficiency in development of the osseous portion of the spinal canal, as the origin of the name, which of itself conveys no idea of the importance of the contents; and remarks were further made to the following effect. It is in reality a local dropsy, consisting of a collection of serum within the serous covering of the spinal cord; and, too often for the safety of the patient, there is also a portion of the nerve-structure of the cord, which has left its proper line, and lies extended under the serous lining of the sac, just under the skin, running, as it were, round or half round the circumference of the swelling, which is often globular, as in this instance. It is this condition chiefly which renders interference with such cases hazardous, and which presents to the mind of the surgeon the possibility of the nervous matter of the cord being so disturbed as to lead to very violent and dangerous manifestations of the effects of irritation of such tissues, in the form of convulsions, which not seldom terminate fatally. Even when left to nature, the rule seems to be, that the subjects of such malformations die, and that early—within the first or second year. To this, it is well known, there are exceptions; still it is the rule. Attempts are usually made by relatives, under professional advice, to protect the part by the use of hollow cup-like shields, lined with cotton, and most carefully attended to; but the result is disappointment, so far as life is concerned. These tumours are far more common in the lumbo-sacral region than in all the other portions of the spine put together; and this is an example of one in the lumbar region.

Treatment.—Allusion has just been made to the palliative or protective treatment, as we may venture to call it; and we now turn our attention to the modes of attempting the radical cure, and giving shortly our reasons for adopting the plan which has been so fortunate in the present instance. Though it may be true that active surgical interference usually hastens death, yet cases have recovered after various kinds of treatment. The presence of the cord, and the free communication with the serous covering of the spine and brain, are the chief obstacles to success. Inflammation of the cord or its membranes, and gangrene of the cord, causing paralysis, may occur, speedily ending in death. Even when left untouched, the skin often ulcerates, the sac bursts, and palsy or convulsions cause death. A spontaneous cure has been known to take place, the orifice of communication having closed, the tumour becomes a closed cyst, and remaining innocuous, or it may be removed. Rupture of the sac has even been followed by recovery. Three modes of interference present themselves—injection, ligature, and excision; and of these three modes, it may be said that each of them has been effected by a variety of means and appliances, which is not my purpose to enumerate at present. Suffice it to say, that I resolve to adopt the first of these, as, in my opinion, the least dangerous of the three. It will be noticed that twice I punctured the sac with a grooved needle, and drew off a considerable quantity of the fluid. These may be called tentative measures, to ascertain whether the membranes could be pierced with safety; and, no suffering or derangement of function having followed, I felt encouraged to use an iodine solution. In forming this solution, I resolved to use glycerine as the solvent; for this reason, that it is a fluid of less diffusibility than a spirituous or even a watery solution. Not that I for a moment imagine that it could not be conveyed along the serous cavity or the serous lining of the spine; still, to my mind, it offered one element of greater security. The strength of the solution may be noted; but then it must be observed that in using it, the sac was purposely only half-emptied of its serum when the iodine solution was injected; and of the latter only about half a drachm was actually injected, so that the then ioduretted contents of the sac presented a very dilute solution. When the repetition of the injection was made, somewhat more of the iodine fluid was used; but part of it escaped and was lost, so that, as the report states, it was not possible to estimate correctly the amount retained. A degree of solidification followed the first injection; and after the second it became complete, and now remains so, the part admitting of ordinary handling without inconvenience or discomfort to the child.

A line of treatment very similar to this has been followed by several of the American surgeons, and with instances of success; but statements are discordant in regard to the proportion which the successes bear to the failures. Several British surgeons have also operated successfully in a limited number of cases and by various methods, but most frequently by injection with iodine as the coagulating or stimulating agent; but I am not aware of glycerine having been used as the solvent on any previous occasion, and I may indulge the hope that others may be induced to try it.

From what I have seen of such cases, it is my belief that the fluid should not be allowed to be drained completely from the sac; this leads to fatal results; and, where a puncture has been made, the aperture, however minute, may be closed and guarded by a layer or layers of collodion, especially when subsequent oozing is feared or perceived.

[A second successful case is related in the same journal, for June 15th, by Dr. Morton.]—*British Medical Journal, April* 6, 1872, *p.* 364.

94.—NEW SPONGE-TENTS, &c.

These tents are made on a new principle by Salt and Son, Birmingham, and have the following advantages over those generally in use, inasmuch as they can be sold at 6s. per dozen, and they dilate more rapidly than the tallow-covered tents. These new tents are coated with cocoa-butter, and therefore do not become displaced before they begin to expand. They are easily introduced, and, unlike the uncoated tents of Dr. Marion Sims, do not become spoiled if not dexterously inserted. They are carbolised, and are made of the actual shape of the "cervix"—oval. Cakes of the solid compressed sponge may be had, from which the surgeon may cut a tent of any size, from those fit to use in the urethra to such as are used for the uterus or rectum. These tents have been made according to directions given by Mr. Lawson Tait.—*Med. Times and Gazette, Nov.* 23, 1872, *p.* 586.

SYNOPSIS,

(Arranged alphabetically,) containing

A short Abstract of the most Practical Articles in this Volume, showing at a glance the most important indications of Treatment published by different writers within the half-year.

AFFECTIONS OF THE SYSTEM GENERALLY.

Fever and some Acute Inflammations.—*Stimulants.*—The following may be said to have been actually demonstrated, a fact beyond further argument: that alcohol administered in small and oft-repeated doses does not excite or increase the inflammatory process, and that inflammation may cease while a patient is taking considerable quantities of alcohol. Mild cases of fever, however, do not require alcohol. Dr. Todd himself never used it except in cases of severe inflammation or fever. There are again differences in the constitution of the patient, requiring corresponding modifications of treatment. Some persons are better treated without alcohol, while others suffering from the very same disorder require a good allowance of stimulant. (Dr. L. S. Beale, p. 24.)

Why do we give Wine in Fever?—Not because the tongue is brown or moist, not because there is delirium, not on any other account than because the state of the circulation requires it. Alcohol is the remedy for failure of the heart's power, and this may occur with or without delirium, and with a dry brown tongue or a moist one. (Dr. L. S. Beale, p. 28.)

Gout.—*New Theory of.*—Gout is not a simple excess of uric acid in the blood, it is an affection of the nervous system. The predisposing cause of gout is undoubtedly the presence in the blood of uric acid, and of soda in some form. Nerve force, when in a healthy condition, preserves these in a fluid state, separately, in a condition in which they may be eliminated by the skin, kidneys, or bowels; as soon, however, as this nerve influence is lessened, these two substances unite, and the disease is produced. The action of colchicum is one proof of this. It is a nerve stimulant, producing invigoration of the mental faculties, with increased action of all the excretory organs. (Dr. Meldon, p. 46.)

Rheumatic Gout.—*Constant Galvanic Current.*—In cases of rheumatic gout, where the most improved medicinal and hydrotherapeutic treatment, intelligently and perseveringly followed, have left the patient no better but rather worse, the constant current may often do a great deal of good. It relieves pain, and for this purpose is far better than the administration of morphia either by the mouth or subcutaneously. It should be applied to the suffering parts, so that the positive pole, armed with a small electrode, is made to touch the sore points, while the negative, connected with a large electrode, is placed in the neighbourhood. The current used may be tolerably powerful. It also has some power in removing deformities of joints actually existing. No one who has not seen a case can have any idea of the beneficial effects which the current will produce, in the long run, on these deformities, even when they are extensive, and where the patients are not very old. A rapid cure must not, however, be expected—perseverance is required. (Dr. J. Althaus, p. 48.)

Small-Pox.—*Injection of Lymph.*—The ordinary process of vaccination by scratching the arm will modify small-pox in infants, but it is almost inoperative in adults. If, however, pure vaccine lymph be injected into the subcutaneous fascia to the amount of the contents of one or two tubes, the disease, although actually commencing, will be arrested, or if rather further advanced, will be modified considerably in its course. For example, two tubes of lymph were injected into the arm of a patient in whom the papular eruption was appearing on the hands and forearms. By the third day all eruption had disappeared. Two tubes of lymph were injected in a case on the second day of the eruption, the patient being unvaccinated and of dissipated habits. The eruption was not arrested, but it began to desiccate on the ninth day instead of the fifteenth, eighteenth, or twentieth. (Mr. R. C. Furley, p. 41.)

Vaccination a Protection from Small-pox.—The period of incubation of small-pox is thirteen days. Vaccination, therefore, has time to run its course and protect the system before the small-pox pustules appear. The most common result, however, is the occurrence of severe symptoms ending with the appearance of a few spots, sometimes of none. But if the symptoms of small-pox commence before the vesicles have risen and begun to desiccate, he will have a severe attack, but modified in so far that there will be no secondary fever. This plan of treating small-pox is useless unless done within a day or two of the onset of the disease. (Dr. W. Marshall, p. 40.)

TYPHOID FEVER.—Animal broths and jellies must be rigidly excluded from the diet. Milk should be the chief article of diet, having a little ice added to it if agreeable, and a little lime-juice in cases in which it returns curdled. Rennetted milk, rice milk, custard, rusks and hot milk, or blanc-mange, generally afford sufficiently varied ways of giving milk. Two or three cups of really good tea or coffee should be given between daybreak and two in the afternoon, every day, unless there is some evident contra-indication in the state of the nervous system. Dr. Parkes found that coffee increases the elimination of urea in fever, and there is no doubt that both it and tea lessen drowsiness and prostration. If early in the fever there is flushed face and headache, a high temperature, and thickly-coated tongue, four or six grains of calomel should be given. Ergotin administered hypodermically is the best remedy in case hemorrhage from the bowels occurs. The following is a good pill to check excessive action of the bowels: three grains of bismuth, one-sixth of a grain of opium, and one-sixth of a grain of carbolic acid. (Dr. J. Little, p. 22.)

Diarrhœa of Typhoid Fever.—The diarrhœa should be checked. The chalk mixture is good, but the chalk has to pass through many feet of intestine before it reaches the part desired. A better mode of treatment is to fill the lower bowel with a starch injection. (Sir W. Gull, p. 19.)

Delirium in Typhoid Fever.—In the treatment of this complication remember that it is owing to brain-irritation, not to inflammation. There is one great remedy for this, and it is alcohol; alcohol is the remedy for nervous irritation in typhoid fever, and, in fact, in any fever. How it acts is not certainly known, but it may be laid down that it is an important point in the treatment of all fevers. It allays nervous irritation and soothes the nervous system. (Sir W. Gull, p. 20.)

Ulceration of the Vagina, Larynx, and other parts, in Typhoid Fever.—There may not only be the ordinary ulceration of the ilium in cases of typhoid fever, but ulceration of other parts. A young girl was sickening of an illness. She had a discharge from the vagina, which led the medical attendant to doubt the girl's chastity; the case was really one of typhoid with ulceration of the vagina. Another case was treated for gonorrhœa; but in reality the patient had typhoid fever with ulceration of the prepuce. Another patient had ulceration of the larynx in the course of typhoid fever; he suddenly became emphysematous. (Sir W. Gull, p. 18.)

AFFECTIONS OF THE NERVOUS SYSTEM.

COLLAPSE.—*Injection of Ammonia into Veins in Collapse Threatening to be Fatal.*—In cases of profound collapse, or in opium poisoning, there is no stimulant equal to ammonia injected into a vein. The solution of ammonia should consist of eight minims liq. ammoniæ fort., with two drachms of cold water. One of the superficial veins of the forearm is to be exposed, and an aneurism needle passed under it; a ligature is then placed on its distal side, while a running noose is left in position over its proximal portion. The finger of an assistant is then placed on the vessel, about a quarter of an inch above the proposed opening, for the purpose of preventing the entrance of air. A slight slit, sufficient to admit the nozzle, is then made into the vein. The syringe, having been charged and all air expelled, is introduced into the vein, and a little fluid injected to dispel the air between the occluding finger of the assistant and the aperture. Simultaneously the aforesaid noose, embracing the vessel, is to be tightened round the nozzle, thus shutting off the connection with the external opening. (Dr. Macewen, Glasgow Med. Jour., Aug. 1872, p. 498.)

Epilepsy.—Hereditary or secondary epilepsy must be considered radically incurable, but induced epilepsy is often amenable to remedies. Each case must be carefully gone into in order to discover and remove the cause of the irritation. The most common causes, such as blows, loss of blood, syphilis, anæmia, &c., are well known. Epileptics are frequently the subjects of constipation, and conversely, constipation, especially in children, is one exciting cause of epilepsy. (Dr. J. T. Dickson, Lancet, Aug. 31, p. 293.)

Bromide of Potassium.—Out of 207 cases in which this remedy was well tried, 17 were permanently cured, 28 remained free from one to two years, 33 improved considerably, 19 less so, and in 110 there was no result. The commencing dose should be half a drachm daily, and it should be gradually increased up to a drachm and a half or two drachms. (Dr. Legrand du Saulle, p. 60.)

Hiccough and Spasmodic Affections.—*Oil of Amber.*—Oil of amber is an antispasmodic of considerable value in cases of hiccough and other spasmodic affections. In the Pharmacopœia of 1809 it was introduced, combined with ammonia, as "Spiritus ammoniæ succinatus." In a case of severe cramps in the limbs during pregnancy the following was the prescription used: ℞. Olei succini, ʒ ss.; liq. potassæ, ʒ j.; tinct. camph. co. ℥ ss.; aquæ menth. pip. ad ℥ vj. M.; an ounce to be taken at bedtime. (Mr. T. T. Griffith, Brit. Med Journal, April 20, p. 422.)

Hysterical and Cerebral or Spinal Paralysis.—*Diagnosis between.*—In cerebral paralysis the nails of the palsied limb cease to grow; in hysterical paralysis they grow as usual. (Dr. S. W. Mitchell, Lancet, June 29, p. 911.)

Local Paralyses.—*Injections of Strychnia.*—The way to use strychnia subcutaneously in cases of local paralysis is, not to inject the weak pharmacopœia solution, for its action is too great in consequence of its rapid absorption, and its effects are also consequently transitory. If, however, a very small amount of a stronger solution is used, its absorption into the system is slow and its effects prolonged. Thus used strychnia has proved successful in the hands of Mr. Barwell in several cases of facial paralysis, several of paralysis of the wrist (independent of syphilis or of lead poisoning), and especially does it afford a hope of curing otherwise incurable cases of infantile paralysis. Mr. Barwell's directions about the strength of the solution and mode of using it will be found in the article. (Mr. R. Barwell, p. 261.)

Sick-Headache.—*Guarana.*—Guarana consists of the powdered seeds of *Paullinia Sorbilis*, a tree growing in Brazil, and contains an alkaloid identical with that found in tea and coffee. It is a remedy of some value in sick-headache. A medical man in Montreal, who is subject to this complaint, writes, "By taking one of those powders and remaining quiet when I have felt premonitory smyptoms, . . . I have carried off the attack; and, with the first box, absolutely put it off for two months—something which had never occurred in my life before." (Dr. S. Wilks, Dr. Latham, p. 59.)

Tetanus.—Examine the wound carefully. A case in the practice of Dr. Ebenezer Watson, of Glasgow, was cured by the removal of a small gravel stone from a lacerated wound of the hand. Dr. Fergusson, of Peebles, relates a case in which a small spiculum of bone was found in the wound. Its removal was followed by a very marked remission in the symptoms. In this case he gave the enormous quantity of 120 grains daily of chloral, and 90 grains of bromide of potassium, for four weeks. There was no bad effect on the general health as might have been expected. (Dr. A. Fergusson, p. 55.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

ANEURISM.—*Occlusion of the Efferent Artery.*—Nature herself has shown us that an aneurism may be cured by occlusion of the efferent artery. A large aneurism of the aorta co-existed with a small one of the subclavian artery, and the aortic aneurism had compressed a portion of the subclavian artery beyond the aneurism so as to obliterate it. The aneurism of the subclavian was nearly filled with layers of coagulum. It has been proved by actual experience that an abdominal aneurism can be mechanically filled with clot, even to its occlusion, by means of mechanical pressure applied to the efferent vessel for only a few hours. The forms of aneurism in which ligature of the efferent vessel or its occlusion in some other way are likely to be called for, are certain examples of abdominal aneurism and of aneurism of the innominate and first part of the subclavian and common carotid arteries. In aneurism of the common iliac and external iliac it may also be of value. (Mr. T. Bryant, p. 126.)

Intra-Thoracic and Abdominal Aneurisms.—Before resorting to more strictly surgical measures of treatment, by which is especially meant galvano-puncture, we should try what can be done by simply "internal" treatment. A case is related by Mr. Jolliffe Tufnell, in which an aneurism of the arch of the aorta became completely consolidated by this plan. The patient should be confined strictly to the recumbent posture during a very long period, the most minute precautions being taken to ensure that he can be kept without raising himself once from the bed during many weeks; his food should be restricted to the smallest quantity of nutritious solids that can satisfy his appetite; and his drink to the very smallest quantity which can be tolerated. An occasional small venesection is serviceable, but large bleedings are to be avoided. The medical treatment of the case otherwise consists almost exclusively in the administration of such narcotics as may be absolutely necessary to calm pain and procure sleep, and such purgatives as may be required to keep the patient comfortable, and avoid all straining in defæcation. The great object is to keep the pulse at an equable rate—a little over 60—and free from all excitement. (Prof. T. Holmes, p. 114.)

CARDIAC DISEASE.—Cardiac disease before forty, is more frequently on the left side of the heart than the right, and is the result of inflammatory change; after forty, disease is more frequent on the right side than the left, and is the result of tissue degeneration. (Dr. C. Black, p. 65.)

Degeneration of the tissues of the body begins at forty. Degeneration of the muscular structure of the heart is especially predisposed to by the habitual respiration of impure air in closely-shut, non-ventilated, hot, stifling rooms, whether in private houses, public buildings, theatres, schools, or manufactories. (Dr. C. Black, p. 67.)

AFFECTIONS OF THE RESPIRATORY SYSTEM.

ASTHMA.—The following is the result of direct experience:—The contractility of the bronchial muscles, *i.e.*, the circular muscular fibres of the tubes, is influenced differently from that of other muscles, by various poisonous or remedial agents. Thus, hydrocyanic acid does not impair it at all, opium and morphia very little, conium and aconite a little more, but belladonna and stramonium almost destroy it; so that in animals poisoned by these drugs the bronchi showed scarcely any signs of contractility when stimulated. In animals poisoned by strychnia, the bronchi seem permanently contracted, so that a stimulus has no further effect. It is worthy of remark that the action of these several drugs on the bronchial tubes is quite different from what it is on the œsophagus and intestinal canal. (Dr. C. J. B. Williams, p. 78.)

CONSUMPTION.—*Koumiss.*—Koumiss is milk which has undergone the vinous fermentation. Warmth and frequent agitation are necessary during the process, or we should have the acetous instead of the vinous fermentation. The milk must be frequently agitated, and the portions which have separated be beaten up with the rest. A portion of sour milk is used as the ferment. If well secured in closed vessels and kept in a cool place, it may be kept a long time. It is highly beneficial as a dietetic, and possessed of considerable virtue as a medicine. In cases of general debility with consumptive symptoms, and in typhoid fever, it is of great use. In the former case patients may drink two quarts daily; and if it acts as in an illustrative case given, they will get fat upon it. (Mr. J. T. George, Brit. Med. Jour., Sept. 21, p. 325.)

Contagiousness of Consumption.—Consumption cannot be contagious as supposed by many. It is a purely constitutional disorder, which may be inherited, or acquired, but not caught. Out of all the nurses employed at the Consumptive Hospital, there has only been one case of consumption, and she was not fit for much at first. Of those now resident, nine have been resident seven years and over, two seventeen years. (Dr. R. P. Cotton, p. 85.)

Croup.—The majority of cases of croup have no false membrane in the trachea or bronchial tubes. The disease is essentially an inflammation of the mucous membrane of the larynx and trachea, accompanied with secretion of tenacious mucus, and swelling caused by effusion into the sub-mucous areolar tissue. The treatment is, a warm room, the air of which is thoroughly saturated with moisture by means of a boiling kettle pouring its steam into the room, linseed poultices to the throat, and an emetic of ipecacuanha. (Dr. R. C. R. Jordan, p. 80).

Chloral and Ipecacuanha in Croup.—In a bad case of croup with urgent dyspnœa, give to a child of fifteen months old two mimims of ipecacuanha wine, with two grains of chloral every two, three, or four hours, according to the effect produced. (Dr. G. Barclay, p. 88.)

Hooping Cough.—Dover's powder is a remedy worth trying in hooping cough. It should be given in doses of one grain thrice daily to a child twelve months old. It lessens the number and the severity of the attacks, and soothes the general irritability which so often exists. (Dr. W. Maccall, p. 84.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

Hemorrhoids.—Unquestionably the best method of treating bleeding internal hemorrhoids is the ligature. It is the simplest, safest, easiest, and most effectual. Nitric acid may be very well in flat sessile piles, but it is of little use where the piles are large or pedunculated. Chloroform should not be given unless in the case of a sensitive female, as you lose the voluntary assistance of the patient in forcing down the hemorrhoids. Large tumours should be tied in two halves. The ligatures should be cut off short, and, the parts being first oiled, the whole should be returned into the rectum. The ligatures separate usually about the sixth or seventh day. (Dr. Van Buren, p. 149.)

Be very careful in ligaturing a pile not to include any of the proper mucous membrane of the bowel, or great unnecessary pain will be caused. It is better not to tie the tumour too close to its base. (Dr. Bodenhamer, p. 150.)

Strangulated Hernia.—Do not go on trying to reduce a hernia if you find it difficult to do, particularly if no previous treatment has been pursued. Especially of use is a hot bath and two hours in blankets afterwards. It is better not to attempt reduction in the bath. If, however, the hernia is not then reducible, chloroform should be given so as to reduce muscular resistance to a minimum. It is of most service in recent or recently enlarged hernia and in inguinal rather than femoral hernia. There are some cases in which reduction should not be attempted without operation, as when the patient vomits fæcal matter and has peritonitis or is in collapse, with a small rapid pulse, hiccough, or other such extreme signs. The risk of the operation is trivial in comparison with that of returning sloughs or ulcerating intestine into the abdominal cavity. There are many other valuable rules given by Sir James Paget in the article from which the above is taken, but which it is impossible to epitomise. (Sir J. Paget, p. 135.)

Is an inflamed hernia strangulated.—The local symptoms present in a strangulated hernia may be present in a hernia which is inflamed and not strangulated. It is rare, however, that the general symptoms—the constipation and vomiting, the quickened pulse and breathing, and the rest, exist when a hernia is inflamed but not strangulated. This is a case in which the diagnosis is very important. It can generally be made thus: in the inflamed hernia without strangulation the local signs precede, and greatly predominate over the remoter and general signs; while in a hernia which is inflamed after becoming strangulated, the remoter and general signs will still predominate over the local, and the history will tell that they preceded. (Sir J. Paget, p. 132.)

Opening the Sac in Hernia.—We should always operate without opening the sac if possible, especially in old and feeble people, and in large herniæ. But our wish to do this must not lead us too far. For there are many cases in which the contents of the sac are not fit to be returned into the abdomen. We should always suspect that the contents of the sac are unfit to be returned in these sets of cases: 1, in those in which strangulation has existed long, say four or more days, whether with slight or with severe symptoms; 2nd, those of whatever date, in which the signs of strangulation are very acute; 3rd, those in which there are very marked signs of advanced or low inflammation in and about the sac; 4th, those in which the contents do not go back easily, and within two or three minutes after all stricture is fairly relieved. (Sir J. Paget, p. 139.)

Seat of Stricture in Inguinal Hernia.—The seat of stricture in the majority of the cases of inguinal hernia I have operated on, was formed by the mouth of the sac, thickened and hardened by what seems to have been an inflammatory process. This annular thickening may, in some cases, be thinned from the outside sufficiently to yield, but more often it is necessary to open the sac and divide the stricture from within. Remember that an easy reduction from an open sac is better than a difficult reduction from a closed one. (Sir J. Paget, p. 139.)

After Relief of Strangulation, is the gut to be returned into the abdomen or not?—If the fluid let out of the sac is turbid, brownish, or muddy, careful consideration is required. If it has a distinct fæcal or putrid odour the gut must not be returned. Clear fluid, merely containing flaky lymph or blood, is a favourable sign of the state of the intestine. The gut itself, for safety of return, should be thin-walled, firm, tense, and elastic, preserving its cylindrical form, smooth, slippery, and glossy. You may return intestine of any colour, short of black, if its texture is good, and its surface shines and glistens; but if the black textures are lustreless, soft, flaccid, or viscid, sticking to the fingers, or looking villous, the parts should not be returned. Colours about which there can be little doubt for signs of gangrene are white, grey, and green, all dull, lustreless, in blotches, or completely over the whole protruded intestine. (Sir J. Paget, p. 202.)

Omentum contained in a Hernial Sac.—A small piece, not adherent, and not more changed than by congestion or slight inflammation, should be returned after the intestine. A very large piece, in the same condition, should also be returned, if it can be done without much force. If, however, the abdomen is tense with over-filled intestine, and it cannot be returned without much force, it should be left in the sac. A small piece, hardened and thickened by old disease, may be returned; a large piece so thickened is better left. When omentum is adherent, but in other respects fit to be returned, you should break the adhesions and return it, after stopping all bleeding. If it be not fit to be returned, leave the adhesions; and in any case do not break adhesions so near the mouth of the sac that their vessels are likely to bleed into the abdominal cavity. (Sir J. Paget, p. 142.)

Failure of Relief by Operation for Strangulated Hernia.—There are some cases in which no relief is given by the operation; these symptoms continue just as if no operation had been done. This may arise from—1, utter exhaustion of the patient; 2, the existence of a constricting band, or the misplacement of the intestine which had been overlooked; 3, the bowel which had been strangulated remaining nipped, powerless, and incapable of contraction, while the part of the canal above it becomes distended; 4, the existence of peritonitis before the operation, which is not relieved by it but continues. (Sir J. Paget, p. 145.)

Aspirating Puncture of Strangulated Hernia.—A case of strangulated inguinal hernia is related by Dr. Leon Labbé, of Paris, in which strangulation had existed about eighteen hours. The patient was seventy years of age, but was in excellent health otherwise. All efforts at reduction having failed, the No. 2 needle of the aspirator was introduced, and two drachms and a half of a yellowish liquid immediately escaped along with a quantity of gas. The tumour flattened immediately, and a very gentle pressure exerted for one minute near the neck of the sac caused complete reduction of the hernia. (Dr. L. Labbé, p. 148.)

It seems to be clearly established that puncturing the intestine freely may be resorted to with every prospect of success. In one case M. Demarquay drew off 120 grammes of intestinal liquid by means of an aspirator. The credit of first discovering this plan of affording relief to strangulation belongs to Mr. Bryant, of Guy's Hospital, who punctured a large irreducible hernia, in four or five places, with a grooved needle and let out a large quantity of flatus, but no fæcal matter. (Mr. Bryant, M. Demarquay, p. 147.)

Pyrosis.—Iodine is a remedy of unquestionable efficacy in checking that kind of vomiting which constitutes what is called pyrosis. Three to five drops of the tincture should be given in an ounce of water. Although this remedy is of value, nitrate of silver, given in pills, immediately after food is perhaps more trustworthy. (Dr. J. K. Spender, Brit. Med. Journ., June 15, p. 636.)

AFFECTIONS OF THE URINARY ORGANS.

Hydrocele.—*New Method of Treating.*—The serous tunic of the testicle is from its nature very liable to take on adhesive action. If a hydrocele is simply tapped, and then the parts equally and firmly strapped, the sac will be obliterated and a radical cure effected. The pressure should be kept up for about three weeks, and the parts never allowed to be pendant during that time. If a case is not cured in this way, inject with iodine in small quantity, and then stick with plaster as before. This plan is free from all risk, which cannot be said of some of the other plans in use, such as the use of a seton and the passing a probe into the sac coated with some caustic. (Mr. S. M. Bradley, p. 172.)

Incontinence of Urine in Boys.—In many cases this is owing to adhesion between the prepuce and glans penis. (Mr. J. C. Foster, p. 168.)

Lithotomy.—In this operation it is not the brilliant, but the careful operator, who is the most successful. The great rule to remember is this, that the minimum of deep cutting gives the most successful results. Having guided the point of the scalpel into the groove of the staff by the finger-nail well pressed down into the groove, the passage of the scalpel forwards so as to cut into the prostatic part of the urethra should be done very carefully, and when the prostatic part is well reached, the operation should if possible be concluded by the finger, the forceps, and the scoop. More cutting than this should rarely be done. If it is a large stone the prostate may be divided a little more freely with the knife, and then the wound allowed to be dilated by stretching or tearing of the tissues as the stone is withdrawn through it, which must be done slowly and steadily, though considerable force may have to be used. The staff should never be withdrawn from the bladder till the finger is upon the stone. (Prof. Humphrey, p. 164.)

Sounding for Stone.—In sounding for stone always take a sound with a very short beak. You are much less likely to miss a stone with such a sound than you are with a longer beaked one, for this reason, that the beak can be turned downwards and so will reach a stone quite in the fundus of the bladder, or in the pouch behind an enlarged prostate. In sounding adults it is a good plan to pass a lithotrite at once, and if a stone is detected to crush it at once. This saves time. An instrument with non-fenestrated blades is the best, as the fragments are more completely crushed by it. (Dr. J. C. Foster, p. 168.)

Spasm of the Bladder.—*Continuous Electric Currents.*—If a continuous electric current is passed through a bladder firmly contracted upon a calculus, or in a state of great irritability, relaxation of the spasm is produced. The action is immediate, and no after ill effects show themselves, as when medicinal substances such as opium are employed. This effect of electricity is of the greatest importance, as it allows of examination of a stone prior to operation, the size and general configuration of which it would otherwise have been impossible to determine. (Dr. Reliquet, p. 88.)

Stricture of the Urethra.—A great number of useful bougies are used on the continent for this affection which are unknown in England. The wood cuts at page 171 will at once give an idea of their nature. (Mr. W. F. Teevan, p. 169.)

Sugar in Urine.—*New Mode of Detecting.*—If much colouring matter or creatine be present in urine the suboxide of copper when found is not precipitated, and what is more important a large amount of uric acid will reduce the copper the same as sugar does. To obviate this source of fallacy filter one or two ounces of the urine several times through good animal charcoal, until the liquid passes through nearly colourless. Then wash the charcoal on the filter with a little distilled water; and to this water, when filtered off, apply Trommer's test. (Dr. J. Seegen, Vienna, p. 91.)

AFFECTIONS OF THE BONES AND JOINTS, &c.

Carbolised Catgut Ligatures.—Catgut is the best possible material for ligatures when it has been long steeped in carbolised oil. It is perfectly tough, flexible, and smooth. It excites no irritation, absorbs no putrescent fluid, and though it gradually melts away, yet holds the artery firmly enough to close its tube permanently. If it be softened too much, as it may easily be if steeped in water, it will relax and not hold the vessel permanently closed. If it be too little softened, as when merely passed through the mouth, it will probably be too harsh and hard. (Mr. T. Holmes, p. 121.)

Dislocations of the Hip.—*Reduction without Traction.*—The importance of fully understanding the anatomy and functions of the Y-ligament, commonly known as the ilio-femoral, cannot be over-estimated in order to a successful treatment of dislocations of the hip. A dislocation into the sciatic notch cannot be reduced by traction unless with the thigh flexed upon the body so as to relax this ligament, and reduction by manipulation also requires the same position. In a case of dislocation "vertically downward" in a child, after chloroform had been given the knee and hip were flexed and the femur rotated in; the head of the bone, however, slipped backwards towards the sciatic notch. At once the femur was rotated outwards, and the head slipped into the acetabulum. (Dr. R. Parker, p. 100.)

Fractured Clavicle.—Take a long and broad strap of good plaster (Maw's moleskin), pass one end of it round the arm below the axilla, and, having well fixed it to prevent slipping, pass the long remaining portion round the back, under the opposite axilla and round the chest, pinning its end to itself to prevent displacement. During this the arm must be brought well backwards until the tightened clavicular portion of the pectoralis major overcomes the sternocleidomastoid, and thus pulls the inner portion of the clavicle down to its level. Another similar strap of plaster should now be made to support the elbow by passing under it and over the opposite shoulder, diagonally across the back and chest. (Dr. L. A. Sayre, p. 108.)

"**Persistent**" **Inflammation of Joints.**—*Oleate of Mercury and Morphia.*—When pure oxide of mercury freshly prepared by precipitation is added to oleic acid it combines with it, forming an oleate of mercury dissolved in oleic acid. A small amount of pure morphia (gr. i. to ℥j.) should also be added. A solution containing 5 per cent. is limpid and yellow, 10 per cent. dark, and 20 per cent. more of the consistence of an ointment, melting at the temperature of the body. Let the 5 per cent. solution be brushed over an inflamed knee-joint which has resisted other means of cure, and the mercury and morphia will be rapidly dissolved, arresting the inflammation and relieving the pain. As a rule, according to the size of the part affected, from ten to thirty drops are sufficient for one application. This should be repeated twice daily for four or five days, then at night only for four or five other days, and afterwards every other day until a cure is obtained. The diffusibility of oleic acid is much greater than that of ordinary oils or fats. The knee is merely taken as an illustration, the same plan is equally efficacious in inflammations of other external parts of the body. (Prof. J. Marshall, p. 102.)

REMOVAL OF THE TONGUE.—*Gag for the operation.*—There are great difficulties in contriving an instrument which shall effectually retain the mouth open during this operation, and which cannot be got rid of by the patient during his struggles when under chloroform. A gag, invented by Mr. John Wood, of King's College Hospital, seems everything which can be desired. It will be found fully described at p. 234. It may be, however, understood thus: Imagine two letter X laid down on the side and placed parallel to one another. The two antero-superior extremities pass under the bicuspids of the upper jaw on each side, the two antero-inferior extremities pass over and depress the bicuspids of the lower jaw. Separation is effected by screws working between the postero-superior and postero-inferior extremities of each side. A strap is passed round the back of the neck to secure it in its place. Each side can be worked separately. (Mr. J. Wood, p. 161.)

SPIRAL SPRING EXTENDER FOR DISEASED JOINTS.—Mr. Holthouse of the Middlesex Hospital describes a spiral spring extender as used by him in cases of diseased joints. It is as efficient as Sayre's splint and less expensive. It is on the principle of the Jack-in-the-box toy. The spiral spring surrounds the thigh, being wider at the upper than the lower end. A purchase is got upon the thigh by plaster and roller bandage over it, just as in Sayre's splint, the tapes or webbing from these plasters being attached to the lower end of the splint by buckles. The larger end of the splint comes against the perineum, which forms the fulcrum. Any amount of traction on the hip joint may be obtained according as the tapes at the lower end of the extender are buckled tightly or loosely. (Mr. C. Holthouse, p. 107.)

SPLINTS.—*The Anterior Suspending Splint.*—The anterior suspending splint—the invention of Prof. Smith, of Maryland University—consists of two parallel wires kept an inch and a half from each other by four transverse fixed bars. It is adapted to the curves of the limb by bending it in the places necessary. The limb is then suspended to it by four or five short bands (see woodcut, p. 151). Several strong rollers should then be applied to the whole length of the limb, to replace the short bands, which are to be withdrawn as the roller is applied. The limb is suspended in the manner shown in the engraving. (Dr. C. Shrimpton, p. 110.)

Sayre's Splint in Fractured Neck of the Femur.—Sayre's splint is a capital instrument for fractured neck of the thigh bone. It has this great advantage over the long splint, that it does not confine the patient to a position of absolute recumbency, without change of posture, thereby avoiding the tendency to the formation of bed-sores and other discomforts. Moreover, the pressure by the perineal band is reduced to a minimum, because the extending force acts on the pelvic pad which is well pressed against the pelvis, and so to some extent bears the strain. In the case in which I tried it the splint gave me great satisfaction; it kept the limb well *in situ*, prevented the common shortening and eversion, and was not inconvenient to the patient. (Mr. W. Colles, p. 108.)

To apply a Plaster-of-Paris Splint.—The plaster bandage is prepared by rubbing fine dry plaster-of-Paris into the meshes of a linen, flannel, or cotton bandage. Linen of loose texture is the best. Tarletan was the material most used by the Germans in the late war, and they strengthened their splints with thin wooden ribbons. The bandages so prepared may be kept ready for use in tin boxes. The limb should first be surrounded with blanket, neatly adapted to it and secured by a few stitches. The bandage is then to be applied, being first immersed for three minutes in hot water and salt. Should the plaster seem to dry during the application the hand, wet with water, should be passed backwards and forwards over it. Three or four bandages should make a firm splint from the toes to the knee. An elegant finish and some additional firmness may be given by smearing over the whole about two ounces of plaster dissolved in as much water. The best time to apply the bandage is as soon after the accident as possible, even whilst the patient is suffering from the shock. (Mr. S. B. St John, p. 94.)

AFFECTIONS OF THE SKIN, &c.

ACNE.—Simple cases require little more than using no soap and washing in hot water. Advanced cases require first, a course of saline aperients, second, the administration of steel, except in cases where there is no particular weakness of system. Some cases even require alkalies. Thirdly, give arsenic as soon as the foregoing remedies cease to have any control over the disease. Few local remedies have any control over the disease—the best is the hypochloride of sulphur, the ointment of which should be smeared pretty thickly over the spots at bed-time. (Mr. J. L. Milton, p. 207.)

BRONCHOCELE.—A swelling of the thyroid gland, big enough to be an extreme deformity and to cause stridulous breathing, will almost always gradually disappear under the steady and prolonged administration of the tincture of iodine, and of the tincture of sesquichloride of iron. No local application of iodine is necessary. The syrupus ferri iodidi is inert for this purpose. (Dr. J. K. Spender, Brit. Med. Journ., June 15, p. 636.)

CHRONIC GLANDULAR ENLARGEMENTS.—Muriate of lime, or as it is more commonly called chloride of calcium, is a remedy of considerable value in chronic glandular enlargements of a strumous character. Also in tabes mesenterica of children. It should be given for many months, twice or three times a day, after meals. A little milk conceals the taste better than anything. Ten grains three times a day may be considered an average dose for a young adult, but it may with advantage be increased to double that amount in some cases. The dose for a young child should be two or three grains. (Dr. Begbie, Ed. Med. Jour., July, p. 46.)

CORNS.—Pull out hard ones by the aid of a small sharp-pointed scalpel or tenotomy knife, and if well done the cure is often radical. Or a small plaster made by melting a piece of emp. plumbi, and dropping it on a piece of white silk, should be worn over the corn for a few days. This will cause it gradually to loosen its hold upon the subjacent healthy skin, and it can then be readily pulled or picked out. Soft corns should be treated by the use of astringents, such as alum dissolved in white of egg, or the careful application of tincture of iodine. (p. 211.)

ERYSYPELAS.—*Styptic-Colloid.*—Richardson's styptic-colloid, painted over the affected surface twice in the twenty-four hours, both relieves the suffering and arrests the progress of erysipelas. It has, moreover, the additional merit of having an agreeable odour and being cleanly. (Dr. G. F. Elliot, Brit. Med. Jour., Oct. 26, p. 466.)

INGROWING NAIL.—Make a small piece of sponge solid, by winding string round it tightly, and drying it. A small pyramidal piece should be inserted just beneath the nail, and secured by strips of adhesive plaster. The sponge will become moist and swollen, keeping the nail from the irritated flesh. Any granulations should previously be destroyed with strong nitric acid. (Mr. B. Blower, p. 211.)

LOCAL INFLAMMATIONS.—*Counter-Irritation with Iodine.*—Practitioners who have been accustomed to apply the feeble tincture of iodine externally, are surprised by the positive and splendid results often obtained by the use, as a counter-irritant, of the linimentum iodi of the B. P. This remedy is one of very old standing at King's College Hospital. It should not be applied over the inflamed part itself, but over the next vascular territory. If it be applied exactly over a bubo, or abscess, or carbuncle, or boil, the inflammation will be increased, but a circumjacent zone of vesication will remove the inflammation; the completeness and rapidity with which this is done being dependent on the width, locality, and intensity of the vesicating patch or circle. In a case of threatening strumous disease of the left shoulder-joint, with much pain and swelling, and some pyrexia, a broad ring of iodine liniment was painted over the lower part of the neck, the adjacent portion of the thorax, and the superior third of the upper arm ; the whole skin area of the joint being left intact within the circle of counter-irritation. The liniment was carefully applied on alternate days, and the forearm supported in a sling. The constitutional treatment consisted of the administration of citrate of iron, iodide of potassium, and cod-liver oil. There was no interruption to the favourable progress of the case. All the joint-symptoms gradually disappeared, and complete recovery ensued. (Dr. J. K. Spender, Brit. Med. Jour., June 15, p. 636.)

PEDICULI.—A solution of the oxide of mercury in excess of oleic acid, by its great penetrating power destroys at once both pediculi and ova, a result not always certain when ointments are used. (Mr. J. Marshall, p. 106.)

TUMOURS.—*Electrolytic action of continuous Electric Current.*—The action of a continuous electric current upon a tumour is simply that of a painless caustic. It does not cause a withering and shrinking of the growth, but a slough, precisely as does any other caustic. It has, however, the great recommendation of being very handy as well as painless. A Stöhrer's battery is very suitable, with twelve cells, and using two needles, the one at the positive the other at the negative pole. Small growths may be rapidly destroyed without complaint of pain on the part of the patient. For the cauterising of small nodules which may spring up about the scar-tissue after removal of a cancer growth, and which if allowed to increase, necessitate for their removal a considerable operation, the continuous current offers an efficient remedy. It does not seem, however, to promise much in the case of large growths. (Mr. G. W. Callender, Brit. Med. Jour., Feb. 10, p. 149.)

ULCERS OF THE LEG.—Having removed all hypertrophied cuticle at margins of the ulcer, it should be hermetically sealed by the application of oiled silk, collodion, and strapping in the following manner: A square piece of soap-strapping, two inches larger than the outer circumference of the ulcer, having a hole made of the exact shape of the ulcer, is applied to the leg; upon this strapping good collodion is applied with a brush, and over the ulcer and strapping one square piece of oiled silk is laid. This at once seals the ulcer, and in order to prevent the edges of the oiled silk from rubbing up, they should be further fastened down with small strips of plaster. If the discharge be profuse the sealing will require to be repeated in a couple of days, but the intervals of removal are quickly prolonged, inasmuch as the exclusion of air limits the discharge and facilitates the formation of skin from the edge of the ulcer. No other application is required, and the ulcer speedily heals. (Mr. B. Holt, p. 211.)

To heal an Ulcer on the Leg without Confinement.—Let the patient apply for several hours, over the ulcer, an ordinary lead lotion, containing a very small amount of carbolic acid, say thirty minims to the half-pint. On removing this, let the wound be cleaned from all scab and surrounding dirt, and let the lotion be reapplied for a few minutes. Then dry the surrounding skin with a piece of soft linen, and let the patient sit or lie for some hours with the parts freely exposed to the air. The surface will become dried and glazed, and in fact, covered with what is practically an impervious membrane. Let the patient go on with his business as usual next day, having the part covered only by the loose trousers. If the ulcer is large or has been suppurating profusely, it will generally be found that suppuration has taken place under the membrane, if we may so call it. In that case the greenish white colour is visible through it. The process must be then repeated. Next night the suppuration will have occurred, and the sore will gradually dry up and no further treatment be required. Cicatrization will go on rapidly underneath, and the membrane will in time assume the appearance of a thin scale or scab, will drop off, leaving a healed but rather depressed surface. (Dr. J. Braithwaite, Brit. Med. Jour., June 1, p. 581).

VENEREAL AFFECTIONS.

Syphilis.—The law of syphylis is the same as that of small-pox, cow-pox, or measles. A man cannot have a fresh attack so long as the disease remains in the constitution. For instance, after indurated chancre and the appearance of secondary symptoms, it is not possible for the patient to contract a new indurated chancre, with swelling of the glands, manifestation of skin disease, and so on. If, perchance, something of the kind takes place the symptoms do not follow the regular evolution. (M. Ricord, p. 212.)

As soon as we have ascertained that there is a hardened chancre with swelling of the glands—not inflammatory, because the glands in this case never suppurate—the mercurial treatment should be begun at once. If this treatment is soon begun and well carried through, the bursting out of the first secondary symptoms, the roseola, the swelling of the glands of the neck, &c., may be prevented. If this is not frequently the case it is because the treatment is resorted to too late, when the disease has had time to take hold. In such cases, if the treatment is steadily pursued, the secondary symptoms, if they have shown themselves, soon disappear. It is, however, necessary to continue the treatment in some cases five or six months, having regard at the same time to sustaining the system in general. If this is done there are very few cases of relapse. If no symptoms have reappeared after six months of mercurial treatment, the treatment with iodine should be begun and continued for five or six months more. The proto-iduret of mercury is the best mercurial preparation to use. (M. Ricord, p. 213.)

Substitute for the Mercurial Bath.—A twenty per cent. solution of oleate of mercury in oleic acid is of the consistence of an ointment. There is no more effectual, cleanly, and unobjectionable method of bringing the system under the action of mercury than the placing of a small piece of this ointment in the axilla, night and morning. (Mr. J. Marshall, p. 106.)

AFFECTIONS OF THE EYE AND EAR.

Amaurosis.—*Subcutaneous Injection of Strychnia.*—The subcutaneous injection of strychnia seems proved to be of great service in the treatment of amaurosis. In an illustrative case the amaurosis had existed two months and a half, and was getting worse. For five weeks strychnia was injected twice a week into the skin of the temple, commencing with $\frac{1}{40}$th of a grain, and increasing it to $\frac{1}{10}$th. The case could not be said to be cured, but so much improved that the patient was able to do his work (watchmaking) with ease. (Mr. C. Higgins, p. 191.)

Atropia in Ophthalmic Practice.—We could better afford to dispens-with all other drugs, lotions, and applications put together, than with this one topical medicament. "It is as safe in ophthalmic practice to use an atropine drop when in doubt, as in whist to play a trump." There are only two absolute contraindications, viz., in the existing oval dilatation of the iris in glaucoma, and in peripheral wounds of the cornea. The most useful strength is expressed in the following formula: Neutral sulphate of atropia, two grains; glycerine, five drops; distilled water, an ounce. (Mr. E. Hart, p. 193.)

Auditory Vertigo (Menière's Disease.)—There are cases which simulate apoplexy very closely, but are really owing to disease in the internal ear, probably in the semicircular canals. It is thought that these canals have no connection with hearing, but form the organ of the sense of equilibrium of the head and thereby of the whole body. In the milder cases there is simply tinnitus and deafness attended with vertigo. In more severe cases vertigo, vomiting, tinnitus, and a fainting condition, leaving behind a certain impediment in motion and unsteadiness in standing and walking. (Dr. J. Hughlings-Jackson, p. 63.)

Conjunctiva.—*Preservation or Destruction of in Extirpation of the Globe.*—It is not in every case advisable that the conjunctiva should be left permanently intact in cases of extirpation of the globe of the eye. The patient may object to wear a glass eye on account of the trouble or the recurring expense, or he may experience such trouble from the conjunctival discharges, that he may wish the annoyance removed if possible. In these cases, and also where from the existence of prominent bands of tissue it is impossible that a glass eye can be worn, it is better to destroy the conjunctival cavity altogether. This cannot be done by the knife. A thin paste of chloride of zinc should for this purpose be smeared over the conjunctiva, and left there a sufficient length of time to destroy completely the mucous surface. It should then be all thoroughly washed away, the lids well closed, and the opposite surfaces allowed to heal. Any small spaces still left should be got rid of by the use of a hot iron. (Mr. J. F. Streatfeild, p. 180.)

Faulty Eyelashes.—*To Eradicate.*—Firmly compress the eyelid between the blades of a suitable entropion forceps. Next pass in the needle of a hypodermic injection syringe at the free edge of the lid, as closely as possible to the hair follicles, and inject an extremely small quantity of tincture of iron. (Mr. P. J. Hayes, p. 178.)

Foreign Bodies in the Ear.—*To Extract.*—Surround a stem delicately with lint, the end of which a little unravelled is dipped in carpenter's glue. None of the glue should touch the outside of the cup of lint. The stem must now be passed down to the foreign body, and left in contact with it from fifteen minutes to an hour, and the fastening then becomes so firm that the foreign body can be extracted by careful management. (Dr. Löwenberg, p. 197.)

Opacities of the Cornea.—*To Tint.*—Opacities of the cornea, whether partial or complete, are often a serious trouble to young persons on account of their unsightly appearance, more so on this account perhaps than on account of the defect of vision produced. The opacity may be tinted with Indian ink, sepia, or ultramarine, according to the colour of the iris or the situation of the opacity. For this purpose a number of the finest needles should be firmly bound together with their points on a level around a handle, and the part tattooed. When an immediate and deeply-coloured effect is desirable, a combination of lampblack with Indian ink, and a solution of nitrate of silver may be used. (Mr. C. B. Taylor, p. 177.)

Purulent Ophthalmia in Adults.—Hard chemosis overlapping the cornea should be freely incised. Astringents should not be used until the acute inflammatory stage has subsided. Alum and tannic acid are the best. Much harm is done by the use of escharotics; they add to the already existing irritation, prolong the disease, and damage the structure of the conjunctiva and that of the cornea. (Mr. H. Walton, Med. Times and Gaz., Oct., 26, p. 456.)

Strumous Ophthalmia.—Belladonna given internally in doses of one-eighth to one-quarter of a grain of the extract is a remedy of the greatest value in the treatment of cases of strumous ophthalmia—diminishing the photophobia, and in conjunction with proper constitutional and local remedies curing the disease, when other means have failed. The best local application is perhaps atropine in a two or four-grain solution. (Dr. H. Power, p. 170.)

Syringing the Ears.—There is a skilful and unskilful way of doing this. The auricle should be drawn upwards between the two fingers of the left hand, so as to put the whole meatus as far as possible in a straight line, and the nozzle of the syringe should be kept in close contact with the roof of the meatus. If the secretion is hard, it should be softened by a little warm water poured in for a few nights previously. (Mr. W. B. Dalby, p. 195.)

MIDWIFERY, AND THE DISEASES OF WOMEN AND CHILDREN.

Artificial Amnion Bag.—In cases where the waters have been early evacuated, but the os is hard and unyielding, or in cases of placenta prævia, when rapid dilatation of the os is necessary, the artificial amnion bag of Dr. Morgan is likely to prove invaluable. It is pear-shaped, and considerably larger and stronger than Barnes's largest dilator, which it otherwise resembles. An unyielding material is contained at the junction of the ball and tube, extending a little upwards and downwards in order that this part may not give way when traction is made upon the ball by means of the tube. The ball is inserted well inside the os, and then dilated with water or air. The head of the child descends during a pain, compresses the upper part of the dilator, which, in expanding below, dilates the os. This is further assisted by traction upon the tube. The instrument is one of great value. (Dr. H. Morgan, p. 216.)

CHRONIC INVERSION OF THE UTERUS.—A uterus inverted for some weeks can very rarely be reduced suddenly. Not only can it not be done, but if attempted, even under chloroform, dangerous collapse will ensue. The best way of proceeding is the following: A ring-pessary, of India-rubber, capable of inflation, and large enough to surround the prolapsed and inverted fundus, is placed so surrounding it and inflated. This steadies and supports the uterus and upper part of the vagina under the pressure of the second pessary, which is globular, and is inflated after introduction just like the first. This presses continuously upon the fundus, being aided by a T-bandage, with a large perineal pad. These should be removed and the passages washed out next day, and then be reintroduced. If after two or three days the uterus is not restored, take a vulcanite stethoscope, cover the chest end with an elastic pad, and press this against the inverted fundus as nearly as possible in the axis of the organ, that is, with the stem pushed back to the fourchette. A T-bandage secures constancy to the pressure. This will with a little management and perseverance usually succeed in restoring the natural relative position of parts. (Dr. J. B. Hicks, p. 249.)

ELEVATION OF DEPRESSED CRANIAL BONE BY PNEUMATIC TRACTION.—A child was born with its right frontal eminence occupied by a depression an inch and a half in diameter. It had been driven in during birth by the somewhat angular pubic arch of the mother. A most ingenious, and as it proved, successful plan of elevating the depressed bone was pursued. A cupping glass was placed over the part, and complete exclusion of air ensured by a cell of glazier's putty. Exhaustion was then effected by a small air-pump. The depressed bone gradually rose and assumed its normal contour. (Mr. H. W. Larkin, p. 113.)

DYSMENORRHŒA.—*Spasmodic or Mechanical.*—There are many strong arguments against the mechanical theory of some cases of dysmenorrhœa. The value and application of the treatment by dilatation have, however, no essential dependence whatever on the truth of the theory which led to its adoption. It seems probable, however that the use of any cutting instrument is likely only to be followed by ultimate induration of the canal or passage by the resulting cicatrices. This, however, is yet to be decided by experience. A plan more to be recommended is the introduction of bougies, gradually increasing in size, until one of No. 18 or 19, in the ordinary male series, can be passed. The bougie requires a little pressure for about a minute in order to cause it to pass the internal os. The dysmenorrhœa-like pain produced is severe, and lasts for about fifteen or twenty minutes, and then the bougie is withdrawn. This plan of treatment causes no injurious inflammation and is not likely to do harm, if it does no permanent good. (Dr. J. M. Duncan, p. 231.)

ENLARGEMENT OF THE UTERUS.—Enlargement of the uterus can only be diagnosed by means of the uterine sound, which is not only one of the most useful, but one of the safest of instruments. Enlargement of the uterus may be the result of subinvolution following abortion or labour, of congestion from retardation or suppression of inflammation, of acute or chronic inflammation of the uterus, or of the presence of fibrous tumours or polypi. Besides these classes, cases of simple hypertrophy of the uterus occur. The organ slowly increases in size. Sometimes the body of the uterus is painful to pressure in these cases. (Dr. Atthill, p. 237.)

[We should have thought the presence of pain upon pressure diagnostic of the existence of metritis, and that in hypertrophy unattended with inflammation that symptom would be absent. EDS.]

FIBROUS TUMOUR OF THE UTERUS.—*Situation of Attachment.*—When one side of the uterus is bulged out the pedicle of the tumour is in all probability attached at the opposite side to the bulging portion. (Dr. G. H. Kidd, p. 246.)

Imbedded Uterine-Fibroid.—When, after dilatation of the internal os, the external os having been previously enlarged with scissors, it is found that a fibroid is imbedded in the uterine walls, although projecting to some extent into its cavity, what is the best plan for proceeding? The case published by Dr. Whiteford, of Greenock, speaks very strongly in favour of Dr. Matthews Duncan's operation, viz., simply dividing with a knife the capsule of the tumour by a crucial incision. This sets free the tumour, which is gradually enucleated by contraction of the uterus, and finally expelled with pains as in abortion. In Dr. Whiteford's case all hemorrhage ceased from the time of the incision. Six months after the operation, regular labour pains came on, and the tumour, which was three or four inches long by one inch in thickness, was expelled. There was a serous oozing, but no other form of discharge during this six months, and the tumour when expelled was not putrescent. (Dr. J. Whiteford, p. 248.)

Immediate Transfusion of Blood.—The author relates a mode of directly transfusing blood from the arm of one person to that of another, which will be at once understood by reference to the woodcut at p. 330. The ball contains only two drachms of fluid, and no valves, which whip the blood when passing through them. The ball and tubes are carefully filled with warm water, which is injected into the patient's circulation by the first compression of the ball. Instead of valves the tubes are to be compressed at one side or the other as necessary. (Dr. J. H. Aveling, p. 227.)

Inertia of the Uterus.—*External Pressure.*—If during labour, when the os is fully dilated, the uterus remains in a state of inertia, let the accoucheur (or some intelligent woman) pass the left arm under the patient and the right above, embracing the uterus between them in a direction parallel with the axis of the brim, interlocking the fingers and spreading them over as large a portion of the fundus as possible. The pressure exercised is to be intermitted so as to imitate the normal uterine contractions. (Mr. L. Tait, p. 231.)

Lacto-Phosphate of Lime in Mineral Inanition.—The importance of phosphate of lime in the animal economy has scarcely been hitherto appreciated. So necessary is it that if deficient the tissues even draw from the osseous skeleton that which is necessary for the maintenance of the integrity of the functions of nutrition. If animals are artificially deprived of phosphate there is a loss of appetite and general debility. Ordinary phosphate of lime is soluble to a great extent in a healthy stomach, but when the digestion and vital power of the system generally is impaired it becomes dissolved with difficulty, or not at all. It may, however, be dissolved artificially in lactic acid, forming a lacto-phosphate of lime, which is easily assimilable. The most convenient forms for administration are Dusart's Lacto-Phosphate of Lime Syrup and Wine. Fifteen grains of the lacto-phosphate is contained in each table-spoonful of syrup. (Dr. Blache, p. 255.)

Mammary Abscess (Threatened).—*Application of Oleate of Mercury.*—Apply a solution of oleate of mercury and morphia in oleic acid, simply brushed over the part. The mercury is rapidly absorbed and arrests the inflammatory action, the morphia at the same time relieving the pain. (Mr. J. Marshall, p. 106.)

"Marasmus" of Children.—*Pancreatic Emulsion.*—In those wretched cases in children, in which every part wastes except the abdomen, pancreatic emulsion in doses of a teaspoonful every four hours is often of signal benefit. It is, of course, necessary that a proper diet should be insisted on at the same time, but proper diet without the pancreatic emulsion will not do. (Dr. Dobell, p. 259.)

Peruvian Bark *versus* Ergot of Rye.—Peruvian bark has a physiological and excitant action on the gravid uterus, and should in deficient pains be preferred to ergot of rye. It may be employed instead of ergot in hemorrhage during gestation or labour. (Dr. A. Monteverdi, Lancet, June 8, p. 808.)

Plugging with Cotton Wool.—It has lately become the fashion to plug with cotton wool, and it certainly possesses great advantages both for introduction and removal. It is not, however, an efficient plug, because when wet it occupies a smaller space than it does when dry. Sponge is the reverse of cotton, it expands when wet, and fills the vagina more completely. It is a most efficient plan to plug the os uteri alone with prepared sponge. (Dr. G. H. Kidd, p. 243.)

Procidentia Uteri.—In a case of complete procidentia in which no form of pessary could be retained, the uterus was placed *in situ*, and the actual cautery applied about an inch and a half from the vulva round the surface of the vagina for the extent of about half an inch. A good cicatrix resulted, which prevented the descent of the os. (Dr. E. Kennedy, p. 241.)

Puerperal Mania.—*Chloral Hydrate.*—In a case of puerperal convulsions terminating in mania, in which there had been no sleep for five days, and in which during that period there had been not the least cessation of the maniacal symptoms, twenty-five grains of chloral procured a refreshing sleep of three hours; and a repetition of this treatment for a few nights effected a complete recovery. (Mr. F. V. M'Dowell, p. 230.)

Sphincters of the Uterus.—Both the external and internal mouths of the womb have their sphincters, as have all the other cavities of the body, the bladder, rectum, and stomach. There is not a separate band of muscular fibres at the os internum forming a regular sphincter, but the circular fibres of that part contract vitally and perform the functions of one. Closure of the orifices is the rule, a patulous condition implies disease. The os internum closes by contact with a cold body, such as the uterine sound, but this cannot be called stricture, and should not be treated as such by ruthlessly dividing it. A wax bougie would often pass where the sound would not. (Dr. J. H. Bennet, p. 217.)

Spina Bifida.—Dr. Morton, of Glasgow, reports a case in which the plan of puncturing with a grooved needle, and subsequently injecting with a solution of iodine in glycerine, proved successful. The punctures made with the grooved needle were closed with collodion after a portion of the fluid had escaped. These punctures were made at intervals of a few days, and about half the remaining fluid was drawn off with a fine trocar at the time of injection with iodine. (Dr. J. Morton, p. 264.)

Starchy Food.—*Inability of Infants to Digest.*—If a quantity of saliva of an infant three or four months old be collected and mixed with a suitable amount of starchy food, it will be found, by the application of Trommer's test, that the saliva has absolutely no power of conversion of the starch into sugar. By experiments upon the pancreas of young animals it is also found that the pancreatic juice is also void of starch digesting power. The importance of these facts on the feeding of infants with starchy food, as is so frequently done, will be at once seen. Even if they could be rendered digestible, starchy foods are not the best for infants. The growing infantile organism needs a greater quantity of those nutriments which afford directly materials to the development of the tissues than do starchy foods. Moreover, the only possible use which starchy foods could be, viz., to afford fuel to maintain the heat of the body, is better fulfilled by fatty matters. (Dr. P. Sonsino, p. 256.)

MISCELLANEA.

Anæsthetics.—*Methylene Ether.*—It is probable that the best form of anæsthetic will turn out to be a combination of ether and Dr. Richardson's bichloride of methylene. Ether is too slow, although free from the danger of chloroform. Chloroform is effectual and rapid, but sometimes dangerous. The combination of ether and methylene is now the last recommendation of Dr. B. W. Richardson. A mixture of pure methylene bichloride and absolute ethylic ether, having a fluid specific gravity of 1.100. The vapour is agreeable. It is best administered from a simple mouth-piece made by Messrs. Krohne and Sesemann. From three to six fluid drachms is the average quantity required. (Dr. B. W. Richardson, Med. Times and Gazette, Nov. 28, p. 564.)

Ether v. Chloroform.—The odour of ether is disagreeable, it is slow in operation, and it gives rise to more excitement than chloroform; but *it is safer.* Chloroform, as may be shown by the hæmadynamometer, first raises and then depresses the heart's action. Ether raises the mercury of the instrument at once, and it never falls again. Ether in very large quantities produces no depressing action on the heart. (Dr. J. Morgan, Med. Press and Cir., July 31, p. 81.)

Although ether may be a little longer in acting than chloroform—and even this is not allowed by some of its advocates—yet, it is so incomparably safer, that it ought to be employed to the exclusion of its rival. It is unnecessary to have any admixture of air with the vapour of ether. Provided the patient breathes he cannot be too rapidly etherised, and there is no danger as in the case of chloroform from the vapour being too concentrated. The patient should not have taken food for three or four hours before, but he may have a cup of tea or a glass of wine. If this simple rule be attended to, the cases in which sickness occurs will be exceptional. A thin hollow sponge covered with a cone of pasteboard, is a good form of inhaler; and upon the sponge about half-an-ounce of pure anhydrous sulphuric ether should be poured. After the first few inhalations, or as soon as anæsthesia is commencing, the sponge may be placed closely over the mouth and nose, and need not be removed, except when it is necessary to apply more ether. (Dr. J. Morgan, Med. Press and Cir., Aug. 28, p. 165.)

Ether, at the worst, is but a profound intoxication, and not unlike a drunken fit. It has always retained the first place amongst anæsthetics in America, never having been superseded by chloroform. In the legitimate use of ether by inhalation, no *bona fide* case of death is on record, or has ever taken place. It is absolutely safe, while the deaths from chloroform are numbered by hundreds. The failures in administering ether are attributed to dread of it; to the practice of administering it guttatim on a thin cloth, with a free admixture of air; to the removal of the towel on the struggle which announces the first stage of anæsthesia; and to the dread of stertorous breathing, and other signs of full etherisation. When the patient struggles, the ether must be held tighter over the mouth and nose, until they take long breaths and finally go off into ether sleep. The less air mixed with the ether vapour the better. (Dr. Jeffries, Brit. Med. Jour., Nov. 2, p. 500.)

Administration of Chloroform.—All inhalers, except that of Clover's, are bad. Out of 109 fatal cases an inhaler of some kind was used in twenty-eight. Clover's inhaler is the best, but even that possesses some disadvantages, the principal of which is, that in cases of very prolonged operation you are obliged to leave the patient for the purpose of refilling the bag. Chloroform was administered 5000 times at Edinburgh without accident, a simple folded napkin or towel being used. Nothing is better than a folded piece of lint, of three or four thicknesses, and of a size that can conveniently be held in the hollow of the fingers and palm. Evaporation from the upper surface of the lint is reduced to a minimum by holding the lint in the hand. The chloroform should be given at first with caution, and one finger placed on the middle temporal artery, the patient's face being exposed and watched. If swallowing, or slight spasm of the glottis occur, withdraw the chloroform and give it more gradually. The great thing required is undivided attention and caution. (Dr. G. V. Poore, Lancet, Oct. 26, p. 594.)

Prevention of Death from Chloroform.—Chloroform should never be administered without a rotatory battery, such as is in ordinary use, being kept ready at hand in case of accident. Should such threaten apply instantly one pole to the neck, and the other over the lower ribs on the left side. It will prove of little use if there is the delay of going to bring the instruments—seconds are of vital moment. Before this plan was adopted at the Bristol Infirmary there were three deaths; since its adoption in 1858, five lives have been saved by it, and no death has occurred. Pulse and respiration had ceased in three of the cases. It is a mistake to give chloroform to a person kept some hours without food, without some support to nerve-power, and brought to an operation under a dread of its consequences, it may be, shivering with cold—brought from a warm bed to a cold room. (Mr. T. Green, Brit. Med. Jour., May 25, p. 552.)

APOMORPHIA AS AN EMETIC.—Apomorphia is a product occurring in the retrograde metamorphosis of morphia. It is a valuable emetic, chiefly because it operates promptly; it may be administered subcutaneously, and indeed acts best in this way; and lastly it leaves no malaise or other ill effects behind. It should be injected into the skin of the abdomen in doses of .005 to .01

gram ($\frac{1}{15}$ to $\frac{1}{7}$ grain). In about three minutes the preliminary symptoms of its action come on, and in five minutes free emesis. No after effects remain longer than half-an-hour from the time of the injection. The hydrochlorate of apomorphia made by Macfarlane and Co., of Edinburgh, is the best. (MM. Riegel and Bœhm, Glas. Med. Journ., May, p. 362.)

Drinking Water.—*To Ascertain the presence of Nitrogen in.*—Concentrate about two ounces of the water to one-eighth of its bulk, without boiling it. When cool pour a little into a test tube to the depth of about an inch. Add an equal quantity of concentrated sulphuric acid. When quite cold, hold the tube nearly horizontally, and pour slowly in about an equal bulk of a pretty strong solution of green vitriol. After standing for half-an hour, if a dark line is visible at the line of junction of the two liquids (which do not mix) the water does not contain less than ·5 part of nitrogen in 100,000, though of course it may contain more. If the water has been derived from wells more than 100 feet deep, this may not show it to be contaminated—for the nitrogen is oxidised, and is an indication of previous sewage contamination. If the water is from a river or surface-well it is probably unfit for use. (Lancet, July 13, p. 46.)

Hypodermic Injection of Morphia and Atropine.—It is a good plan to combine $\frac{1}{30}$ grain of sulphate of atropia with each $\frac{1}{4}$ grain of morphia injected. This has a twofold effect. (1) It diminishes the tendency to nausea so constantly following the administration of morphia alone; and (2) it produces anodyne effects not to be obtained by morphia alone. If more atropine is injected symptoms of atropism show themselves—usually slight delirium or very rapid action of the heart. The effects of an over-dose of atropine can be counteracted by the administration of more morphia. (Dr. J. M. Finny, Dublin Jour., July, p. 38.)

Solution of Morphia for Hypodermic Injection.—Dissolve 10 grains of hydrochlorate of morphia in two drachms of distilled water by the aid of heat, without any acid, spirit, or glycerine. Two minims of this solution, *i.e.* one-sixth of a grain, should be the commencing dose. It becomes solid at ordinary temperatures, and when wanted for use must be heated. The advantage is, that however long it is kept the solution never spoils. (Dr. H. Lawson, p. 54.)

Lentil Meal.—Lentil meal properly prepared and ground to a fine powder, and mixed with some other impalpable nitrogenous meal, such as rye meal, possesses many valuable qualities. It is highly nitrogenous, and possesses four times the nutriment power of beef, weight for weight. It is very cheap —2½ lbs. costs twenty-pence. The same quantity of the absurdly dear revalenta costs six shillings. It is so digestible that there is an absence of flatulence during the process. (Brit. Med. Jour., Sept. 7, p. 277.)

Nicotine as an Antidote to Strychnia.—Professor Haughton, of Dublin, relates a case of strychnia poisoning which was treated by drop doses of nicotine in whisky punch every half-hour. At the second dose the paroxysms became less violent and the muscles of the abdomen softer. Four doses produced relaxation of the muscles. This confirms previous experience on this subject. Dr. Fraser, Professor of Materia-Medica, at Aberdeen, says that nicotine combines a feebly paralysing effect on the motor nerves, with a more decided paralysing action on voluntary muscular fibre. The action of nicotine very much resembles that of physostigma (or calabar bean), acting, however, more directly upon the muscles, and producing complete relaxation of them. Physostigma acts by diminishing, and in large doses destroying the reflex acivity of the spinal cord. (Brit. Méd. Jour., June 22, p. 660.)

INDEX TO VOL. LXVI.

Abortion, Mr. Freer on the use of ergot in 219
Acne, Mr. Milton on the pathology and treatment of 207
Acute rheumatism with hyperpyrexia, Dr. Thompson's case treated by baths 51
Affleck and Macdonald, Drs., on delivery by spondylotomy in shoulder presentation 222
Alcohol, Dr. Beale on its value in the treatment of low fevers and inflammation 24
" chemical action of on the constituents of the blood . . 32
" its direct action on the heart and in promoting the capillary circulation 28
" its indirect action on the blood, and on the bioplasm of the tissues 28
Allingham, Mr. W., on the treatment of hemorrhoids . . . 153
Althaus, Dr. J., on the treatment of rheumatic gout by galvanism . 47
Amaurosis, Mr. Higgins's cases treated by subcutaneous injection of strychnia 191
Anæsthetic, Dr. Jeffries on the advantages of ether as an . . 283
" Dr. Morgan on ether versus chloroform as an . . 282
" Dr. Poore on the administration of chloroform . . 283
" Dr. Richardson on methylene ether as an . . 282
" Mr. Green on prevention of death from chloroform . 283
Aneurism, Mr. Bryant on the treatment of 126
" Prof. Holmes on the surgical treatment of . . . 114
" innominate, Mr. Bryant on Wardrop's operation for . 127
" innominate, curative influence of Brasdor's operation in . 116
" internal or medical treatment of 115
" popliteal, Dr. Barton's case cured by pressure . . 129
Anterior suspending splint, Prof. Smith's, in fractures of lower extremity 110
" synechiæ, when and where to iridectomise in cases of . . 182
Antiseptic catgut ligatures for arteries, Mr. Holmes on . . . 121
Apomorphia as an emetic, MM. Reigel and Bœhm on . . . 288
Artery constrictor, Dr. Speirs's, Mr. Bryant on 129
Articular inflammation, persistent, use of oleates of mercury and morphia in 106
Ashton, Mr. T. J., his method of treating hemorrhoids . . . 155
Asthma, Dr. Williams on the pathology of 73
" Dr. Williams on the treatment of 76
" habitual, Dr. Williams on the treatment of . . . 77
Atropia, Mr. Hart on its value in ophthalmic surgery . . . 198
Atthill, Dr. L., on the diagnosis of enlargement of the uterus . . 237
Auditory vertigo (Meniere's disease), Dr. Hughlings-Jackson on . 68
Aveling, Dr. J. H., his successful case of immediate transfusion . . 227

Barclay, Dr. J., on the use of chloral in croup 88
" " " on the use of chloral in delirium tremens . . 57
Barnes's dilators, Dr. Morgan on a new use of 216
Barton, Dr. J. K., his case of popliteal aneurism cured by pressure . 129
Barwell, Mr. R., on infantile paralysis and its resulting deformities . 261
Beale, Dr. L. S., on stimulants in febrile and inflammatory diseases . 24

Belladonna, its use in hooping cough 84
Bennet, Dr. J. H., on the external and internal orifices of the uterus . 217
Blache, Dr., on rachitis and mineral inanition 253
Black, Dr. C., on relative frequency of disease between right and left sides of heart 65
Bladder, procidentia of; Dr. Kennedy's case of 242
" urethra and ureters, Dr. Reliquet on the continuous electric current in spasms of 88
Blenorrhœa, use of guarana powder in 60
Blower, Mr. B., on ingrowing toe-nail 211
Bodenhamer, Dr. W., on the treatment of hemorrhoids . . . 150
Bougies, Mr. Teevan's description of French elastic . . . 170
Brachialgia, Dr. Lawson on the hypodermic injection of morphia in . 54
Bradley, Mr. S. M., on a new method of treating hydrocele . . 172
Brand, Dr. E., on a new remedy for catarrh 87
Bromide of potassium in epilepsy, Dr. Legrand du Saulle on . . 60
" of potassium, its use in hooping-cough 85
Bronchocele, Dr. Spender on the treatment of 276
Bryant, Mr. T., on puncture of the intestine in strangulated hernia . 147
" " " on the treatment of aneurism 126

Cardiac disease, relative frequency of disease between the right and left side of heart 65
Cassells, Dr. J. P., on treatment of exanthemal catarrh of the tympanum 198
Cataract, Mr. Critchett on the operations for 188
" Mr. Streatfeild on the advantages of using two sharp hooks in operations for 183
Catarrh, Dr. Hagner's remedy for 87
" of the tympanum, exanthemal, Dr. Cassell on . . 198
Catheters, Mr. Mercier's 172
Chloral, Dr. Barclay on its use in croup 83
" Dr. Barclay in its use in delirium tremens 57
" and bromide of potassium in a case of traumatic tetanus . 55
" its use in hooping cough 85
Chloroform, Dr. Poore on the administration of 283
" Mr. Green on the prevention of death from . . . 283
Cilia, faulty, Mr. Hayes on a new mode of destroying in districhiasis . 178
Clavicle, fractured, Prof. Sayre's method of treating 108
Cold affusions in febrile nervous affections, delirium, ataxy, &c. . 37
" baths in the treatment of enteric and typhus fevers . . 38
" douche in collapse, ready mode of administering . . . 37
Collapse, threatened, Dr. Macewen on injection of ammonia into the veins in 268
Colles, Mr. W., his application of Sayre's splint to fractured neck of femur 108
Collie, Dr. A., on the cold bath in enteric and typhus fevers . . 38
Conjunctiva, Mr. Streatfeild on preservation or destruction of in extirpation of globe 180
Consumption, Mr. George on the use of koumiss for 270
" and contagion, Dr. R. P. Cotton on 85
Cornea, Dr. Taylor on the act of tinting opacities of the . . . 177
Corns, removal of 211
Cotton, Dr. R. P., on consumption and contagion 85
Cranial bone, depressed, Mr. Larkin on pneumatic traction for elevating 113
Critchett, Mr. G., his practical remarks on the treatment of cataract . 188
Croup, Dr. Barclay on the use of chloral in 83
" Dr. Jordan on the diagnosis and treatment of 80
Cutaneous therapeutics, Dr. Fox on the general principles of . . 201

Dalby, Dr. W. B., on some affections of the ear 197
Deafness induced by cerumen in the meatus, Dr. Dalby on . . . 195
Delirium in typhoid fever 19
" tremens, Dr. Barclay on the use of chloral in 57

De Renzy, Mr. A. C., on the extinction of typhoid fever in Millbank prison 20
Diarrhœa of typhoid fever 19
Diphtheria, Dr. Jordan on the diagnosis of 82
Dislocations, hip and shoulder, Dr. Parker on reduction without traction 101
Districhiasis, Mr. Hayes on a new method of destroying faulty cilia in 178
Dobell, Dr., on the use of pancreatic emulsion in marasmus of children 258
Drinking water, to ascertain the presence of nitrogen in 283
Dudgeon, Dr., his submersion tube for microscopic examination of urine, &c. 87
Duncan, Dr. J. M., on dysmenorrhœa and its treatment 231
Dysmenorrhœa, Dr. Bennet on the supposed existence of uterine stricture in 218
" Dr. Duncan on the treatment of 231

Ear, Dr. Cassells on exanthemal catarrh of the tympanum 198
" Dr. Dalby on deafness induced by cerumen in the 195
" Dr. Dalby on inflammation of the external auditory meatus 196
" Dr. Dalby on the treatment of small abscesses in the 196
" MM. Troltsch, Goltz, and Knapp on Meniere's disease of the 63
" foreign bodies in, Dr. Dalby on the removal of 194
" foreign bodies in, Dr. Lowenberg's methods of removing 197
Eczema of the outer ear, Dr. Dalby on the treatment of 196
Electricity, Dr. Fiddian on its use in a case of muscular atrophy 60
" in spasm of the bladder, urethra, and ureters, Dr. Reliquet on 88
Electrolysis in the treatment of stricture of the rectum 155
Emphysema, vesicular, of the lungs and habitual asthma, Dr. Williams on 77
Enema apparatus, Mr. Shepard's two new forms of 163
Enlarged uterus, Dr. Atthill on the diagnosis and treatment of 237
Enteric fever, Dr. Collie on the cold bath in the treatment of 38
Epilepsy, Dr. Dickson on 269
" Dr. Legrand on the use of bromide of potassium in 60
Epileptic puerperal convulsions treated by chloral hydrate 230
Epithelial cancer, Mr. Wood on removal of the tongue for 161
Ergot, Mr. Freer on its use in abortion 219
Erysipelas, Dr. Elliott on the use of styptic colloid in 276
Ether, its advantages over chloroform as an anæsthetic 282
Exostoses of the external auditory meatus, Dr. Dalby on the treatment of 197
Extension of diseased joints, Mr. Holthouse's spiral spring apparatus for 107
Eyeball, extirpation of, preservation or destruction of the conjunctiva 180

Ferguson, Dr. A., his case of tetanus treated with chloral and bromide of potassium 55
Femur, fractured neck of, Mr. Colles's treatment of 108
Fever, Dr. Beale on the use of stimulants in 24
" enteric and typhus, Dr. Collie on the cold bath in 38
" typhoid, Dr. Little on the treatment of 22
" typhoid, Mr. de Renzy on its extinction in Millbank Prison 20
" typhoid, Sir Wm. Gull on 17
Fibrous tumours of the uterus, Dr. Kidd on 243
" tumour of the uterus, Dr. Whiteford's case of imbedded 248
Fiddian, Dr. A. P., on magneto-electricity in the treatment of muscular atrophy 60
Foreign bodies in the ear, Dr. Dalby on the removal of 197
" Dr. Lowenberg's methods of removing 197
Forster, Dr. J. C., on lithotomy and lithotrity 168
Fox, Dr. T., on the general principles of cutaneous therapeutics 201
Fracture of the clavicle, Dr. Sayre's new method of dressing 108
" of the femur, Dr. St. John on the treatment of 97
" of the femur, Mr. Colles's application of Sayre's splint for 108
" of the humerus, Dr. St. John on the treatment of 100

Fracture of the leg, Dr. Shrimpton on the value of the anterior suspending splint in 110
" of the patella, Dr. St. John on the treatment of 99
" of the radius, Colles's, Dr. St. John on the treatment of 100
" of the tibia and fibula, Dr. St. John on the treatment of 98
" of the ulna, Dr. St. John on the treatment of 99
Fractures, Dr. St. John on plastic apparatus for the treatment of 93
Freer, Mr. A., on the value of ergot in abortion 219
Furley, Mr. R. C., on the treatment of small-pox by vaccination 41

Galvanic current, continuous, in the treatment of rheumatic gout 47
Genito-urinary diseases, Mr. Teevan on some new instruments for 169
Glandular enlargements, chronic, Dr. Begbie on the treatment of 276
Gout, Dr. Meldon on a new theory of 46
" rheumatic, Dr. Althaus on its treatment by the constant galvanic current 47
Grieve, Dr. R., his cases of small-pox treated by hypodermic injection of vaccine lymph 42
Guarana, Dr. Latham on its use in sick-headache 59
" Dr. Wilks on its use in sick-headache 59
Gull, Sir W., on typhoid fever 17

Hart, Mr. E., on the employment of atropine drops in eye diseases 193
Hayes, Mr. P. J., on a new method of destroying faulty cilia in districhiasis 178
Heart, Dr. Black on relative frequency of disease between right and left sides of 65
Hemorrhage after lithotomy, Prof. Humphry on 166
Hemorrhoids, Dr. Bodenhamer on the treatment of 150
" Dr. Van Buren on the treatment of 149
" Mr. Allingham on the treatment of 153
" Mr. Ashton on the treatment of 155
" Mr. Salmon's mode of treating 154
" Mr. Smith on the use of the clamp for 152
Hernia, strangulated, Sir J. Paget's lectures on 131
" strangulated, Dr. Labbe's case of puncture of the intestine in 148
" strangulated, Mr. Bryant on puncture of the intestine in 147
Hiccough and spasmodic affections, Mr. Griffith on oil of amber in 269
Hicks, Dr. J. B., his two cases of chronic inversion of the uterus 249
Higgins, Mr. C., his cases of amaurosis treated by subcutaneous injection of strychnia 191
Hip and shoulder dislocations, Dr. Parker on reduction without traction 101
Holmes, Mr. T., on the surgical treatment of aneurism 114
Holt, Mr. B., on the treatment of ulcers of the leg 211
Holthouse, Mr. C., his spiral spring extender for diseased joints 107
Hooping-cough, Dr. Maccall on the treatment of 84
Hughlings-Jackson, Dr. J., on auditory vertigo (Meniere's disease) 63
Humphry, Prof., on lithotomy 164
Hydrocele, Mr. Bradley's new method of treating 172
Hyperæmic skin diseases, Dr. Fox on the treatment of 205
Hyperpyrexia, Dr. Straus on the external application of cold in 37
Hypodermic injection of morphia, Dr. Lawson on the treatment of sciatica by 54
" injection of morphia and atropine, Dr. Finny on 284
" injection, solution of morphia for, Dr. Lawson on 284
Immediate transfusion, Dr. Aveling's case of 237
Inertio of the uterus, Mr. Tait on the treatment of 231
Infantile paralysis, Mr. Barwell on, and its resulting deformities 261
" wasting, Dr. Dobell on pancreatic emulsion in 258
Infants, Dr. Sonsino on the physiological dyspepsia for starchy food in 256
Inflammatory diseases, Dr. Beale on the use of stimulants in 24
Ingrowing nail, Mr. Blower's treatment of 211

Inversio uteri, chronic, Dr. Hicks's apparatus for reduction of . . . 249
Iridectomy, Mr. Streatfeild on, in cases of anterior synechiæ . . 182

Joint diseases, Mr. Holthouse's spiral spring extender for . . . 107
" inflammation, persistent, Mr. Marshall on the treatment of . 104
Jones, Mr. S., his treatment of varicocele 174
Jordan, Dr. R. C. R., on croup 80

Kennedy, Dr. E., on procidentia of the uterus, and of the bladder . 242
Kidd, Dr. G. H., on fibrous tumours of the uterus . . . 243
Knee-joint, persistent inflammation of, Mr. Marshall's treatment of . 105

Labbe, Dr. L., his case of puncture of intestine in strangulated hernia . 148
Labour, Dr. Swayne on laceration of the perineum during . . 220
" delivery by spondylotomy in shoulder presentation . . 223
" tedious, Dr. Morgan on a new use of Barnes's dilators in . 216
Lacto-phosphate of lime syrup and wine, M. Dusart's . . 255
Larkin, Mr. H. W., on elevation of depressed cranial bone by pneumatic traction 113
Latham, Dr. P. W., on guarana as a remedy for sick-headache . . 59
Lawson, Dr. H., on the treatment of sciatica, lumbago, and brachialgia 54
Leg, ulcers of, Mr. Holt's treatment of 211
Legrand du Saulle, Dr., on bromide of potassium in epilepsy . . 60
Lentil meal, its value in indigestion 284
Lithotomy, Prof. Humphry on the operation of 164
" Dr. Forster on 168
Lithotrity, Dr. Forster on 169
Local inflammations, Dr. Spender on the treatment of . . . 276
Lowenberg, Dr., on removal of foreign bodies in the ear . . 197
Little, Dr. J., on the treatment of enteric fever . . . 22
Lumbago, Dr. Lawson on the hypodermic injection of morphia in . 54

Maccall, Dr. W., on the treatment of hooping-cough . . . 84
Mammary inflammation, use of oleates of mercury and morphia in . 106
Marasmus of children, Dr. Dobell on pancreatic emulsion in . . 259
Marshall, Mr. J., on treatment of persistent inflammation by oleates of mercury and morphia 102
Marshall, Dr. W., on the treatment of small-pox by vaccination . 40
M'Dowell, Mr. F. V., his case of puerperal mania treated by chloral hydrate 230
Meldon, Dr. A., on a new theory of gout 46
Mercury and iodide of potassium in syphilis, M. Ricord on . . 214
Methylene ether as an anæsthetic, Dr. Richardson on . . . 282
Microscopic examination of urine, Dr. Dudgeon's submersion tube for . 87
Milton, Mr. J. L., on the pathology and treatment of acne . . . 207
Morgan, Dr. H. M., on a new use of Barnes's dilators . . . 216
Morphia, hypodermic injection of, in sciatica, lumbago, and brachialgia . 54
Morton, Dr. J., his cases of spina bifida cured by injection . . 264
Moxon, Dr. W., his case of paraplegia lasting five years—electrical anæsthesia 57
Muscular atrophy, Dr. Fiddian on magneto-electricity in the treatment of 60

Neuralgia, Dr. Latham on guarana as a remedy in 59
Nicotine as an antidote to strychnia 284

Oleates of mercury and morphia in the treatment of persistent inflammation 102
Opacities of the cornea, Dr. Taylor on the modern art of tinting . . 177
Ophthalmia, strumous, Dr. Power on the treatment of . . . 174
Ophthalmic surgery, Mr. Hart on the value of atropia drops in . . 193

Paget, Sir J., his lectures on strangulated hernia 181
Pancreatic emulsion, Dr. Dobell on its use in the marasmus of children 258
Paralysis, Dr. Mitchell on the diagnosis between hysterical and cerebral 269
" infantile, Mr. Barwell on the treatment of 261
" local, Mr. Barwell on subcutaneous injection of strychnia in 262
Paraplegia lasting five years, Dr. Moxon's case of 57
Parker, Dr. R., on reduction of hip and shoulder dislocation without traction 101
Pediculi, Mr. Marshall on solution of oleate of mercury in . . 106
Perineal abscess, threatened, use of oleates of mercury and morphia for 106
Perineum, Dr. Swayne on laceration of, during delivery . . . 220
Peruvian bark versus ergot of rye 281
Persistent inflammation, Mr. Marshall on treatment by oleates of mercury and morphia 102
Peruvian bark versus ergot of rye, Dr. Monteverdi on . . . 281
Phthisis, Dr. Cotton on the non-contagiousness of 85
Plastic apparatus for the treatment of fractures, Dr. St. John on . 93
Popliteal aneurism cured by pressure, Dr. Barton's case of . . 129
Power, Dr. H., on the treatment of strumous ophthalmia . . 174
Procidentia uteri, Dr. Kennedy on 242
" vesica, Dr. Kennedy on 242
Puerperal mania, Mr. M'Dowell's case treated by chloral hydrate . 230
Purulent ophthalmia in adults, Mr. Walton on 279
Pyrosis, Dr. Spender on the treatment of 273

Rachitis and mineral inanition, Dr. Black on 253
Rectum, stricture of, Dr. Whitehead's cases of 155
Reliquet, Dr., on the action of continuous electric currents on spasms of the bladder, urethra, and ureters 88
Rheumatic gout treated by the constant galvanic current . . 48
Rheumatism, acute, with hyper-pyrexia, successfully treated by baths 51
Ricord, M., on syphilis 212
Roberts, Dr. G. W., his treatment of a case of traumatic tetanus . 56

Sayre, Dr. L. A., his new method of putting up fractured clavicle . 108
Sciatica, Dr. Lawson on its treatment by hypodermic injection of morphia 54
Seegen, Dr. J., his method of detecting small quantities of sugar in urine 91
Shepard, Mr. W. L., on two new forms of enema apparatus . . 163
Shoulder-presentation, case of delivery by spondylotomy in . . 222
Shrimpton, Dr. C., on the anterior suspending splint in fractures of the leg 110
Sick-headache, Dr. Latham on guarana as a remedy for . . . 59
" Dr. Wilks on guarana as a remedy for 59
Skin diseases, Dr. Fox on the general principles of the therapeutics of 201
Small-pox, Dr. Grieve on the hypodermic injection of vaccine lymph in 42
" Dr. Marshall on its treatment by vaccination . . 40
" Mr. Furley on its treatment by vaccination . . 41
Smith, Mr. H., on the treatment of hemorrhoids by the clamp . . 152
Sonsino, Dr. P., on the physiological dyspepsia for starchy food in infancy 256
Sphincters of the uterus, Dr. Bennet on the 217
Spina bifida, Dr. Morton's cases cured by injection 264
Spiral spring extender, Mr. Holthouse's, for diseased joints . . 107
Spondylotomy, Drs. Affleck and Macdonald on delivery by, in shoulder presentation 222
Sponge-tents, Mr. Lawson Tait's new 266
Starchy food, Dr. Sonsino on the physiological dyspepsia for, in infancy 256
Streatfeild, Mr. J. F., on iridectomy in cases of anterior synechiæ . 182
" " " on the advantages of using two sharp hooks in cataract operations 183
" " " on preservation or destruction of conjunctiva in extirpation of globe 180
Stimulants in febrile and inflammatory diseases, Dr. Beale on . . 24

St. John, Dr. S. B., on plastic apparatus in surgery . . . 98
Strangulated hernia, Sir J. Paget on 131
Strangulated hernia, Dr. Labbe on puncture of the intestine in . 148
" " Mr. Bryant on puncture of the intestine in . 147
Straus, Dr., on the external application of cold in hyperpyrexia . 37
Stricture of the rectum, Dr. Whitehead's treatment of . . . 155
Strumous ophthalmia, Dr. Power on the treatment of . . . 174
Sugar in urine, Dr. Seegen's method of detecting small quantities of . 91
Swayne, Dr. J. G., on laceration of the perineum in labour . . 220
Sycosis menti, obstinate, Mr. Marshall on the treatment of . . 106
Synovitis, use of oleates of mercury and morphia in . . . 106
Syphilis, M. Ricord on the treatment of 212
" congenital, Mr. Marshall on the use of oleate of mercury in . 106
Syphilitic affections, Mr. Marshall on oleate of mercury preparations in 106

Tait, Mr. L., on the treatment of inertia of the uterus . . 231
Taylor, Dr. C. B., on the modern art of tinting opacities of the cornea . 177
Teevan, Mr. W. F., on instruments for treating genito-urinary diseases 169
Tents, Mr. Lawson Tait's new sponge-tents 266
Tetanus, traumatic, Dr. Fergusson's case treated with chloral and bromide of potassium 55
" traumatic, Dr. Roberts's treatment of a case of . . 56
Thompson, Dr. H., his case of acute rheumatism with hyperpyrexia treated by baths 51
Tobacco amaurosis, Mr. Higgins on two cases of . . . 192
Toe-nail, ingrowing, Mr. Blower on the treatment of . . . 211
Tongue, Mr. Wood's operation for removal of, for cancer . . 161
Tonsillitis, obstinate, use of oleate of mercury and morphia in . 106
Traction in cataract operations, advantages of using two sharp hooks for 188
Transfusion, "immediate," Dr. Aveling's successful case of . . 227
Trephining, Mr. Larkin on pneumatic traction in place of . . 113
Tumours, Mr. Callender on the treatment of 277
" uterine fibrous, Dr. Kidd on 243
" uterine fibroid, Dr. Whiteford's case of imbedded . . 248
Typhoid fever, Sir Wm. Gull on 17
" fever, Dr. Little on the treatment of 22
" fever, Mr. De Renzy on its extinction in Millbank prison . 20
Typhus fever, Dr. Collie on the cold bath in the treatment of . . 38
Ulceration of the vagina, larynx, &c., in typhoid fever . . . 18
Ulcers of the leg, Dr. J. Braithwaite on the treatment of . . 277
" of the leg, Mr. Holt on the treatment of 211
Urethra, Dr. Mallez's instrument for injecting powders into the . 172
Urine, Dr. Dudgeon's submersion tube for microscopic examination of 87
" Dr. Seegen's mode of detecting sugar in 91
Uterine inertia, Mr. Tait on external pressure in the treatment of . 231
" fibrous tumours, Dr. Kidd on 243
" fibroid imbedded, Dr. Whiteford's case of 248
" stricture, Dr. Bennet on the supposed existence in dysmenorrhœa
Uterus, Dr. Bennet on the external and internal orifices of the . . 217
" chronic inversion of, Dr. Hicks's treatment of . . . 249
" enlargement of, Dr. Atthill on the diagnosis and treatment of . 237
" procidentia of, Dr. Kennedy on 242

Vaccination, Dr. Marshall on the treatment of small-pox by . . 40
" Mr. Furley on the treatment of small-pox by . . 41
Vaccine lymph, small-pox treated by hypodermic injection of . 42
Van Buren, Dr., on the treatment of hemorrhoids . . . 149
Varicocele, Mr. Jones's treatment of 174
Vertigo, auditory, Dr. Hughlings-Jackson on 68

Whiteford, Dr. J., his case of imbedded uterine fibroid . . . 248
Whitehead, Dr. W. R., on the treatment of stricture of the rectum . 155
Wilks, Dr. S., on guarana as a remedy for sick-headache . . . 59
Williams, Dr. C. J. B., on asthma 73
" " " on vesicular emphysema of the lungs—habitual asthma 77
Wood, Mr. J., on removal of the tongue for epithelial cancer . . 161

THE

RETROSPECT

OF

PRACTICAL MEDICINE AND SURGERY,

BEING

A Half-Yearly Journal,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY
W. BRAITHWAITE, M.D.,
LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN AT THE LEEDS SCHOOL OF MEDICINE, ETC.,

AND
JAMES BRAITHWAITE, M.D., LOND.,
ASSISTANT-SURGEON TO THE LEEDS HOSPITAL FOR WOMEN AND CHILDREN.

PART LXVII.............JULY.....................1873.

UNIFORM AMERICAN EDITION.

NEW YORK:
PUBLISHED BY W. A. TOWNSEND.
1873.

S. W. GREEN, Printer, 16 and 18 Jacob Street, New-York.

CONTENTS OF VOL. LXVII.

SYNOPSIS.

PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

ARTICLE.	AUTHOR.	PAGE.
1 On Relapsing Fever	*Editor of the Medical Press and Circular*	17
2 Remarks on the Etiology of Enteric Fever, in connection with its Relation to the Strumous Diathesis	*Dr. H. Kennedy*	18
3 On the Pathology of Scarlatina, and the Relation between Enteric and Scarlet Fevers	*Dr. John Harley*	21
4 An Outbreak of Enteric Fever at the Village of Nunney, in Somersetshire	*Dr. Ballard*	23
5 Carbonate of Ammonia in Scarlet Fever	*G. J. S. Camden, Esq.*	23
6 A Mechanical Theory of Fever		24
7 Transfusion of Milk in Cholera	*Dr. E. M. Hodder*	25
8 On the Relation of Gout to Uric Acid	*Dr. W. M. Ord*	26
9 On the Treatment of Lumbago and Rheumatism with Actæa	*Dr. J. J. H. Bartlett*	31
10 Blood Poisoning in Man and Animals	*N. Alcock, Esq.*	32
11 On Lead Poisoning	*Dr. F. E. Anstie*	33
12 On Rodent Cancer	*J. W. Hulke, Esq.*	35

DISEASES OF THE NERVOUS SYSTEM.

13 The Principles of Treatment of Migraine	*Dr. F. E. Anstie*	37
14 On Certain Forms of Visceral Neuralgia	*Dr. Clifford Allbutt*	39
15 Ergot in Headache	*Dr. Silver*	42
16 On some Diseases of the Nervous System—Spasmodic Affections	*Dr. S, Wilks*	42
17 On Chorea and its Treatment	*Dr. W. F. Wade*	46
18 Clinical Illustrations of the Value of Phosphorus in certain Forms of Disease of the Nervous System	*Dr. W. H. Broadbent*	48
19 On the Hypodermic Injection of Strychnia in Paralysis	*Dr. W. Carter*	50
20 On the Hypodermic Use of Strychnia	*Dr. J. J. Chisolm*	52
21 On the Therapeutical Uses of Galvanism	*Dr. S. Wilks*	52
22 On the Application of Electricity	*Editor of the Canada Lancet*	57
23 On the Influence of the Continuous Galvanic Current over Voluntary Muscular Action	*Dr. G. V. Poore*	58
24 Cases illustrating the Employment of Central Galvanisation in various Sensory Disturbances	*Dr. T. Buzzard*	60

DISEASES OF THE ORGANS OF RESPIRATION.

25 On the Use of Ergot in the Hæmoptysis of Phthisis	*Dr. F. E. Anstie*	63
26 Ergotine, its Use Subcutaneously in Hemorrhage	*Dr. Drasche*	68
27 On Inflammation of the Lung as a Cause of Consumption	*Dr. A. E. Sansom*	68

DISEASES OF THE URINARY ORGANS.

28 Observations on the Skim-Milk Treatment of Diabetes Mellitus	*Dr. A. S. Donkin*	72

ARTICLE.	AUTHOR.	PAGE.
29 On the Pathology and Diagnosis of Acute Bright's Disease	*Dr. J. Johnson*	78
30 Digitalis in Dropsy		81
31 Alcohol as a cause of Renal Disease . .	*Dr. W. H. Dickinson*	82

SURGERY.

FRACTURES, DISLOCATIONS, AND DISEASES OF BONES, JOINTS, ETC.

ARTICLE.	AUTHOR.	PAGE.
32 On Colles's Fracture of the Radius and its Treatment	*Dr. J. A. Macdonald*	84
33 On a New Method of Excising the Elbow-Joint in cases of Anchylosis	*T. Annandale, Esq.*	85
34 On some of the more Recent Methods of Treating Wounds on Antiseptic Principles .	*D. J. Hamilton, Esq.*	86
35 Illustrations of the Surgical Uses of the Pneumatic Aspirator	*T. R. Jessop, Esq.*	90
36 On Exploring and Tapping	*Dr. W. Roberts*	96
37 On the Treatment of Talipes Varus . .	*F. Clowes, Esq.*	99
38 On the Operation of Opening the Larynx by Section of the Cartilages, for the Removal of Morbid Growths	*A. E. Durham, Esq.*	100
39 New French Method of Dressing Wounds .	*Dr. W. Reid*	103

ORGANS OF CIRCULATION.

ARTICLE.	AUTHOR.	PAGE.
40 On the Surgical Treatment of Aneurism in its Various Forms	*T. Holmes, Esq.*	105
41 Case of Popliteal Aneurism cured by Digital Compression in Eight Hours . . .	*W. MacCormac, Esq.*	108
42 A New Mode of Applying Pressure in Popliteal Aneurism	*Dr. H. Thompson*	110
43 Acupressure, with a Description of a Modification	*Dr. J. C. Ogilvie Will*	111
44 Case of Aneurism of the Arch of the Aorta treated by Galvano-puncture . . .	*Dr. McCall Anderson*	112
45 Plugging the Posterior Nares	*Dr. R. P. B. Taaffe*	115
46 An Improved Means of Plugging the Posterior Nares	*A. Godrich, Esq.*	116

ALIMENTARY CANAL.

ARTICLE.	AUTHOR.	PAGE.
47 Removal of the Entire Tongue for Cancer by the Galvanic Ecraseur	*Walter Whitehead, Esq.*	117
48 A New Hernia Knife	*Dr. A. Patterson*	120
49 On Hemorrhoidal Affections	*C. Heath, Esq.*	121
50 On Polypus of the Rectum, Prolapsus, Fissure, and Fistula in Ano	*Do.*	124
51 Treatment of Pruritus Ani	*W. B., & Dr. Thompson*	129

ORGANS OF URINE AND GENERATION.

ARTICLE.	AUTHOR.	PAGE.
52 On the Influence of Renal Disease on the Choice of Operation for Stone in the Bladder .	*Sir H. Thompson*	130
53 On the Removal of Foreign Bodies from the Male Bladder	*Dr. G. H. Porter*	135
54 On the Treatment of Stricture of the Urethra	*Sir H. Thompson*	140
55 On a New Method of Treating Retention of Urine and Impassable Stricture . .	*F. Jordan, Esq.*	144
56 The Treatment of Stricture	*Dr. P. J. Molony*	146
57 On Retention of Urine	*Dr. G. H. B. Macleod*	147
58 A Case of Impassable Stricture of the Urethra Successfully Treated by Leeching and Gradual Dilatation	*W. F. Teevan, Esq.*	147
59 On the Selection of Positions for Catheterism	*Do.*	149

ARTICLE. AUTHOR. PAGE.
60 On Renal Calculus, Gravel, Gout, and Gouty Deposits, and the Value of Lithium Salts in their Treatment . . . . *Dr. A. B. Garrod* 150

DISEASES OF THE EYE.

61 On Conjunctival Transplantation from the Rabbit . . . . *Dr. J. R. Wolfe* 153
62 Practical Remarks on the Treatment of Cataract . . . . *G. Critchett, Esq.* 158
63 The Removal of Cataract by Solution, especially with regard to the Soft Cataract of early life, and the Operations by Keratonyxis . . . . . . *Dr. A. H. Jacob* 160
64 Section of the Orbicular Muscle and Integument of the Outer Canthus, as a prelude to the Extraction of Cataract . . *E. Chesshire, Esq.* 164

AFFECTIONS OF THE SKIN.

65 On a New Method of Treating Ulcers . . *P. Cowen, Esq.* 165
66 Abortive Treatment of Furunculi . . 167
67 On Fenestrated Non-Adhesive Plaster for Skin-Grafting . . . . . *Dr. J. W. Bligh* 167
68 The Treatment of Boils by Alcohol . . *M. Nelaton* 168

SYPHILITIC AFFECTIONS.

69 On the Communication of Syphilis in the Practice of Vaccination . . . . . *J. Hutchinson, Esq.* 168
70 On Vaccination-Syphilis . . . *Editor of the Lancet* 173
71 Vaccino-Syphilis . . . . . *G. G. Gascoyen, Esq.* 175

MIDWIFERY,

AND THE DISEASES OF WOMEN AND CHILDREN.

72 On the Treatment of some Uterine Diseases *Dr. Lombe Atthill* 177
73 Induction of Premature Labour . . *W. Whitehead, Esq.* 182
74 Remarks on a New Midwifery Forceps . *Dr. F. Vacher* 185
75 On Cephalotripsy . . . . . *Dr. J. Wallace* 189
76 On the Treatment of certain forms of Menorrhagia and Uterine Hemorrhage, by means of the Sponge Tent, with special reference to their occurrence in Women Residing in Tropical Climates . . . . . *Dr. G. G. Bantock* 191
77 The Subcutaneous Injection of Extract of Secale Cornutum in Fibro-Myoma of the Uterus . . . . *Prof. Hildebrandt* 195
78 On Junod's Boot as a Remedy in some forms of Amenorrhœa . . . . . *Dr. E. Garrett-Anderson* 196
79 On the Essential Cause of Dysmenorrhœa, as Illustrated by Cases of Partial and Complete Retention . . . . . *Dr. R. Barnes* 197
80 The Orifices of the Unimpregnated Uterus, and their Surgical Treatment . . . *Dr. J. M. Duncan* 202
81 On Mechanical and Forcible Dilatation of the Cervix Uteri . . . . . *Dr. H. Bennet* 205
82 On the Treatment of Prolapsus Uteri . . *Dr. C. R. Drysdale* 207
83 The Treatment of Prolapsus Uteri without Mechanical means . . . . . *Dr. N. Andreef* 207
84 On Reduction of the Uterus in Chronic Inversion . . . . *Dr. R. Barnes* 209
85 Two Cases of Large Fibroid Tumour of the Uterus Successfully Treated by Enucleation . . . . *W. R. Jordan, Esq.* 211

ARTICLE.		AUTHOR.	PAGE.
86	On the Causation of Acquired Flexions of the Uterus and their Pathology	*Dr. Squarey*	213
87	On Fibroid Degeneration of the Uterus and the best way of Treating it	*Dr. P. Smith*	214
88	On Intra-Uterine Medication in the Treatment of Chronic Uterine Catarrh	*Dr. W. S. Playfair*	217
89	On the Various Modes of Applying Remedies to the Internal Surface of the Uterus	*Dr. R. Barnes*	224
90	On Ovaralgia	*Dr. T. C. Allbutt*	227
91	New Insufflator for Treating Diseases of the Uterus	*John Clay, Esq.*	229
92	Intra-Uterine Injections	*Dr. J. Whitehead*	230
93	Guaiac in Ovarian Affections	*Prof. Cleland*	231

ADDENDA.

94	On Methylene Ether, or Ethyl	*Dr. B. W. Richardson*	233
95	Methylene Ether as an Anæsthetic	*Lawson Tait, Esq.*	234
96	Practical Observations upon Ether as an Anæsthetic	*Dr. C. B. Taylor*	235
97	The Danger of Chloroform and the Safety of Ether as a medium for producing Insensibility to Pain	*Dr. J. Morgan*	236
98	Note on the Administration of Ether	*J. Couper, Esq.*	238
99	Report of Fifty Cases of Ether Administration in the General Infirmary at Leeds	*A. F. McGill, Esq.*	239
100	Report on the Administration of Ether as an Anæsthetic in Hospitals		240
101	Stages of Anæsthesia	*Dr. Kidd*	241
102	On the Choice of Anæsthetics	*J. Hutchinson, Esq.*	242
103	Description and Illustration of an Ether Inhaler, with Observations upon a Mixture of Chloroform and Spirit of Wine for Producing Anæsthesia	*B. W. Richardson, Esq.*	243
104	Nourse's Ether Inhaler		245
105	Ether *versus* Chloroform	*J. T. Clover, Esq.*	246
106	On Anæsthetics	*Dr. T. Jones*	246
107	On the Treatment of Chloroform Poisoning	*Dr. G. V. Poore*	248
108	Chloroform in "Shock"	*Dr. Kidd*	250
109	Case of Fatal Suffocation from Nitrous Oxide Gas	*Editor of the Lancet*	250
110	Bismuth as an External Application in Skin Diseases		252
111	On the Use and Abuse of Atropine	*R. Leibreich, Esq.*	252
112	Atropine as an Antidote to Opium	*Dr. J. Johnson*	255
113	On the Action of Narceine		257
114	Ammonia in Workshops as a Preventive of Mercurial Poisoning	*Dr. Meyer*	257
115	On the Therapeutic Uses of Electricity	*Dr. S. Wilks*	258
116	On the Use of the Direct and Induced Currents of Electricity	*Dr. W. G. Smith*	261
117	A New Anodyne Colloid	*Dr. Lackerstein*	262
118	Tincture of Veratrum Viride in Acute Rheumatism	*Dr. W. Carter*	262
119	Local Employment of Chlorate of Potash in Cancerous Sores	*Dr. Burow*	263
120	Clinical Remarks on the Resina Copaibæ as a Diuretic	*Dr. S. Wilks*	263
121	The Absorption of Tobacco Smoke	*Dr. C. R. Drysdale*	264

PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

1.—ON RELAPSING FEVER.

By the EDITOR OF THE MEDICAL PRESS AND CIRCULAR.

The outbreak of relapsing fever in London seems likely to prove more serious than was at first thought likely. It was natural in a season of unusually low mortality to hope that the appearance of this fever on the Registrar General's books was only for a single week, and due to causes that, if not understood, were at least not about to give rise to much further mortality. The fact has, however, proved otherwise. We have already heard of the dreaded disease in Nottingham, Manchester, and other parts, besides the area of the Metropolis in which it first appeared this time. The country is certainly threatened with another invasion of the disease, and it becomes Medical men to be on the alert. We are glad that the Medical Department of the Local Government Board is awake, and has already issued the following directions :—

1. Relapsing fever is in a very high degree communicable from sick to healthy. The greatest personal predisposition to the disease is given by states of poverty and privation : so much so that the disease is often known by the name of famine-fever. The more confined the atmosphere in which sick and healthy are together, the more certain is the disease to be communicated.

2. Relapsing fever is eminently a disease which cannot safely be treated in the houses of the poor ; for in them, crowded and ill-ventilated as they generally are, and with inmates often insufficiently nourished, there must be every likelihood that the infection will spread. It is essential that under such circumstances the sick should at once be removed from amid the healthy. Ample hospital accommodation is therefore an indispensable condition for limiting the extension of the disease.

3. Where relapsing fever has attacked, and when all its acute symptoms are past, the sufferers remain for a while extremely weak, requiring that food and restoratives should be liberally supplied them ; in default of which, the feebleness left by the disease may often be of indefinite duration. This is the more important, because, where relapsing fever becomes epidemic, typhus often accompanies or follows it ; and persons whom the relapsing fever has weakened not unfrequently fall victims to typhus.

4. At present (as in all times when epidemic disease is prevalent or threatening) it is particularly important that powers conferred by the Nuisances Removal and other general Sanitary Acts should be well exercised by those in whom they are vested. Very detailed district-inspection is most necessary. Everything practicable should be done, especially in all the poorer parts of each district, to promote cleanliness of and about dwellings. The washing and lime whiting of uncleanly premises, especially of such as are densely occupied, should be pressed with all practicable dispatch. It is essential that overcrowding should, as far as possible, be prevented, and proper ventilation be enforced ; and in these respects common lodging-houses, and houses which are sub-let in several small holdings, will require particular attention. Great vigilance must be used with a view to the discovery of the first cases of relapsing fever in such houses ; and frequent inquiry should be made as to the sorts of illness prevailing among the poor. The attention of Authorities is invited to the powers con-

ferred on them by various sections of the Sanitary Act of 1866, with reference to infectious disease; especially to the powers conferred for purposes of disinfection, and for the conveyance of sick persons, and for the separation of the sick from the healthy.

5. Relapsing fever, as described in Medical text-books, has the following characters. The patient becomes suddenly ill with shiverings, headache, heat of skin, prostration, and generally vomiting. To these symptoms are usually added more or less yellowness of skin, and severe general pains resembling those of rheumatism. After from five to seven days the symptoms abruptly cease. For a week the patient feels well, and has his ordinary appetite, his natural temperature, and a pulse often even slower than in health. On or about the fourteenth day from the commencement of the original attack, relapse takes place, with a sudden paroxysm of fever similar to the first. The duration of the stage of relapse is commonly three days. Second, or even several, relapses sometimes occur; and, as above stated, convalescence is usually protracted. —*Medical Press and Circular, Jan.* 15, 1873, *p.* 48.

2.—REMARKS ON THE ETIOLOGY OF ENTERIC FEVER, IN CONNEXION WITH ITS RELATION TO THE STRUMOUS DIATHESIS.

By Dr. HENRY KENNEDY, A.B., connected with Sir P. Dun's, and (lately) the Cork Street Hospital.

The causes which by many are thought to be paramount in causing our fevers are too many, and the very utmost that can be allowed them is that they predispose to the engendering of fever, but that they will not actually excite it.

Now, in considering these predisposing causes of fever, it has always seemed to me that too much consideration has been given to one side of the question. Air, earth, water, sewerage, atmospheric changes, food and famine, vegetable and animal organisms, and other causes, have all been elaborately written about in connexion with the subject. The seeds of disease, if I may so call them, have been deeply investigated; but the soil on which they were to fall and take root has been scarcely recognized or taken into account at all; and yet I have the strongest conviction that this part of my subject is deserving our closest attention, and of throwing much light on the etiology of fevers, and on none more than the type of fever known as enteric or typhoid. It is quite true that the state of our frames, at a time when what is known as the epidemic influence prevails, has been long recognized as modifying sickness, and in a very marked degree. But I wish to push the idea much farther, and to show that the very fever itself undergoes a change, and this owing solely to the constitution or frame in which the fever is lighted up. This, then, is the point I have in view in the following remarks; and, without further preface, I shall now proceed to consider it. In doing so it will be necessary to begin by making a few general remarks.

In the first place, it may be observed, that the very same causes do not lead to the same results as regards the effects on our frames. I may illustrate this by supposing the cases of four persons, each of whom gets a wound of a similar kind. What are the chances that these will terminate in a similar way? One or two may heal up kindly; another may slough; another may get erysipelas; and still another tetanus. Or a man, after a slight sprain, exhibits gout; or after a fall, and without any wound, gets the terrible disease, diffuse inflammation. It cannot be doubted that in each and all these cases it is the state of the constitution which determines the result; and that had there been no tendency to gout or erysipelas these affections would not have arisen. But further still, a man breaks the neck of the thigh-bone, and dies at the end of ten or twelve days of a fever not to be distinguished from typhus; or he goes off in the same way after anthrax or carbuncle; or, indeed, after any surgical operation, no matter how trifling. No one here ever questions the fact that it is the constitution is at fault, and so leads to the fatal result.

Keeping these facts in view, let us see if there be any similar ones in our fevers; and as typhus is one with which we are all more or less familiar, I shall, in the first instance, take it. Now, no one who has seen two or more members of the same family, coming from the same room and afflicted with this disease, can fail to have observed the marked differences, I might almost say contrasts, which they present. This is not the place to enter into these differences, whether it be the spots, the symptoms, the complications, or the duration of the attack. Suffice it to say they exist. Yet we cannot for a moment suppose that these differences are due to anything but a difference in the constitution of the patient; and this it is which impresses itself on the whole character of the fever. But these differences show themselves in what may be called another aspect. For typhus differs in different years—a fact which my predecessors in the Cork Street Hospital noticed again and again; and indeed the remark may be made of other diseases, which vary much in character at different periods, no matter what some of our Edinburgh friends may have stated to the contrary, and particularly as regards pneumonia, which one might suppose from their writings was a stereotyped disease, from which there could be no deviation. Is it necessary to remind you that the great Sydenham observed and taught differently? Anyone, too, familiar with the history of our recent epidemics in this country, cannot fail to have observed the marked contrasts which they exhibited. Thus, the great epidemic fever of 1817-18 was very different in its characters from that of 1847-48, which latter some of us may recollect. But it is not merely different periods which exhibit different phases of the same disease. On the contrary, we have positive knowledge that typhus fever is, in London, a much more fatal disease than with us. My own impression, too, is the same as regards typhoid. At any rate as regards typhus, the fact is known and admitted, and I believe it would hold true of other diseases; nor do I know that any more interesting paper could be written than one which would contrast the diseases of London and Dublin, for it seems to me there are some very marked differences between them. But I only make this as a passing remark; and coming nearer home, and in close connexion with my subject, I may remind you of the marked contrast in the rate of mortality which typhus presents, according as it attacks the poorer or the middle and higher classes. It is certainly more than double, if it be not three times, as fatal in the one as the other. Explain this as we may, it may be assumed that it is not due to anything special in the contagion itself, for such an idea would only be adding to the difficulties in the matter which already exist. To my mind, it is much more rational to attribute this difference of mortality to mental or bodily causes, or both combined, rather than a difference of poison, which only adds another difficulty where there is already enough.

The conclusion, then, I would draw from the several points—I may indeed call them facts—to which your attention has been directed this evening, is, that the state of our frames, when poisons strike them, has a most important influence on the symptoms, progress, and result of each particular disease; and that this view goes far in explaining many of the apparent anomalies which surround the subject.

It will now be seen, I trust, how what has been advanced can be brought to bear on the etiology of enteric fever. My hearers are aware that for many years past the cause of this type of fever has been considered as totally different from that which causes typhus. Many amongst ourselves hold it; in London it still keeps its ground; and my friend Dr. Murchison has even gone so far as to name enteric "Pythogenic fever," from the idea that dirt was the great leading cause of the affection. In this view I cannot, with all respect, concur. I believe dirt, in every form, to be a strong predisposing cause of fever, but that it will lead to typhus as well as typhoid. That the latter is the isolated affection, which many hold, I cannot for a moment suppose; and I rather think that some, if not a good many, now hold different views on this point from what they did some years since. I am not, however, about to enter here into the arguments which I think can be adduced in favour of the view that typhus and typhoid are the result of a common cause. This I have done on more than one occasion previously. But I cannot help alluding to one fact, which my friend Dr. Grimshaw has recently made out, viz., that typhus and typhoid will arise in the same room, and at the same time. Need I say how totally at variance this fact is with the statement of Sir W. Jenner? I may add, too, that every other point of specific difference between the two types of fever can, I believe, be as easily controverted as this one. I repeat, however, that the entering into such details would be quite out of place at present.

But if we assume for a moment that these two types of fever arise from one common cause, how, it will be asked, do I account for the different symptoms and progress of the two affections? How is it that they present such signs as enable us to distinguish them—the one from the other—in the great majority of instances? The answer to this question is the main object for which I come before you this evening; and keeping in mind what has been already advanced, it will be understood that I believe it is owing to the state of the constitution that the differences between the two types of fever are to be chiefly explained; and further, that enteric or typhoid fever is essentially due to the presence in the patient of more or less of the strumous diathesis. That constitutions vary in this respect admits of no doubt. Some exhibit the diathesis in a very marked degree, and others in a very trivial way; and so it is with the type of fever with which I believe it to be more or less closely connected. This idea may to most appear very far-fetched; but it seems to me to be sustained by a number of facts, which I shall now proceed to notice briefly.

There are, I imagine, few who have not been struck with the general aspect of a patient labouring under enteric fever,—I do not mean from the effects of the fever, but the general conformation of the individual. In the great majority of instances they will be observed to be persons of a fine skin, and many of them of a high complexion. Their frame and hands are delicately formed, and it is by no means uncommon to find marks of one kind or other on their persons. Thus you may see them blear-eyed, or with spots on the cornea; or, if they be children, on the head, or, what cannot well be overlooked, and what has frequently come under my own notice, you will see scars on the neck, the result of enlarged glands, and suppuration following. In keeping, too, with these appearances, which, to say the least of them, betoken delicacy, we must keep in mind the duration of this fever, which seldom ends before the twenty-fifth, and is often prolonged to the fortieth day. As regards relapses, too, it is singularly marked in its character, and in this respect is extremely like other affections which are avowedly strumous, such as strumous pneumonia or ophthalmia.

Of the symptoms to which enteric fever gives rise, there are two which call for notice here. The first is hemorrhage, which is so frequent in this affection, whether from the nose, chest, or bowels; and yet this is just what we might anticipate from the nature of the constitution with which we have to deal. For it has always seemed to me that a frame tainted with struma is one, above all others, likely to exhibit hemorrhage.

The second symptom of which I would speak is the affection of the lungs, which is such a frequent complication of enteric fever. This is not the place to enter into the details of this affection. Suffice it to say, it is one of a specific character; that it resists treatment in an infinitely greater degree than the analogous affection met in typhus; that it frequently puts on all the characters of phthisis, and in a certain percentage of cases does run into that disease. I am not sure that I could adduce any single fact which would bear more strongly on the point I am now discussing than the one just stated, and I know it has been met by others; and one gentleman in England, in the course of last year put on record different cases where phthisis followed directly on enteric fever. Long since I myself have done the same, and I rather think Dr. Grimshaw can now give similar evidence. The number of cases, too, where, short of the actual invasion of phthisis, the symptoms persist for an indefinite period, is very remarkable. On many occasions I have sent patients out of Hospital with the hope that the change would serve them. But this part of my subject may exhibit itself in another aspect, as the following case exemplifies:—

Case.—A young man, of nineteen years of age, applied to me before Christmas, 1871. Different members of his family had died of phthisis, and there was no difficulty in making out that he also suffered from the disease. Under treatment he rapidly improved; that is, the symptoms all lulled, and he gained flesh, and became able to follow his occupation. In this way matters went on till October last, when I was asked to see him, and found him in bed, suffering from enteric fever in a well marked form. He had no less than three crops of eruption. After a very prolonged attack he got somewhat better, but I am sorry to have to add that the chest symptoms became then much more marked, and the poor fellow fell into what might be called a galloping consumption, which, in January of this year, carried him off. In another case, too, of enteric fever, which I saw with Surgeon Rogers, of William-street, where there was severe hemorrhage from the bowels, I learned that two years before the patient had been threatened with phthisis, and had spit blood.

In opposition to all this again I may advert to the frequency of the bronchitis which complicates typhus; and yet I have not met a single instance where this was succeeded by phthisis. I do not say it does not occur, but only that I have not met it. On the contrary, I have seen two instances where I knew that phthisis existed. Both of these passed through a very severe attack of spotted typhus, yet in both the phthisis was left just as it had been before the fever.

In the last place I may advert to the great similarity which exists between the morbid states of the ilium and mesenteric glands, met with in phthisical patients, and the morbid state of parts, the result of enteric fever. To myself there seems no difference. If this be so, it will not seem strange that I consider them as the result of some common cause—at least until some more plausible explanation of the great similarity of the two morbid states be given. This idea in itself alone would lead to the conclusion that enteric fever was, or might be, called strumous fever. But I do not pretend to assert that the point is as yet settled.

The view brought before the meeting this evening has not been taken up hurriedly. On the contrary, it is the result of many years' observation; and in papers published long since I have adverted again and again to the same idea. Whether it be true in its entirety, as has been first said, I will not take on me to assert. But it may, I think, be assumed as proved that the presence of the strumous constitution, no matter in how slight a degree, is capable of materially modifying the symptoms and process of the type of fever known as enteric, and that it should ever be looked for. If the view advanced be correct it is quite plain to my mind that our prognosis will receive a degree of exactness which it has never yet done, and that our treatment will be essentially modified by our knowledge of the nature of the constitution with which we have to deal.—*Dublin Jour. of Med. Science, March*, 1873, *p.* 257.

3.—ON THE PATHOLOGY OF SCARLATINA, AND THE RELATION BETWEEN ENTERIC AND SCARLET FEVERS.

By Dr. John Harley, late Physician to the London Fever Hospital, and Assistant Physician at St. Thomas's Hospital.

[The pathology of scarlatina is so neglected a subject that no connected account of it exists in medical literature. As will be seen from the sequel, however, it is a disease of the lymphatic system, attended with inflammatory action of this system of glands, including the spleen, mesenteric glands, tonsils, and the solitary and agminated glands of the intestines.]

If we take the pathological conditions into one general view it will appear that *febris lymphatica is the appropriate scientific definition of scarlatina;* that death is very likely to occur during the first week of the disease from the formation of fibrinous clots in the heart and great vessels; that the condition of the biliary function is such as to lead to an outbreak of diarrhœa; that mesenteritis, and enteritis sometimes general but usually confined to the solitary and agminated glands, exist from the third day and onwards during an attack of scarlet fever, both being at their acme during the height of the fever, *i.e.* from the third to the seventh day; that the enteritis is usually latent, but ready to declare its presence upon slight provocation; and that this inflammatory condition of the mesenteric and intestinal glands may persist to the sixty-ninth day.

From this view *one general conclusion as to the connection of scarlet fever and* *enteric fever is inevitable, viz., that the pathological changes accompanying an attack of scarlatina include all those of the first stage of enteric fever, and are so far identical with them.* And it follows therefore that the transition from the former disease to the latter is nothing more than a natural pathological sequence, readily determined by any cause which may increase the intestinal irritation.

Having traced the relation which subsists between scarlatina and enteric fever to its extreme results, I will, with the view of giving more completeness to my account, narrate a few instances in which symptoms of the two diseases coexisted. And, as an appropriate introduction to these examples, I will briefly indicate the points where the outward symptoms of the two diseases meet and overlap one another. In the early stages of scarlatina and enteric fever the bowels are usually confined; in the latter stage of scarlatina they are occasionally loose, and the stools have the same character as those of enteric fever. Rose papules are not to be observed in many cases of enteric fever; and they may, if carefully sought for, be occasionally found in scarlatina. But such papulæ as usually occur in enteric fever—I mean the few, often indistinct rose spots which mark the pallid skin, and which we may properly regard as diagnostic of the disease—such papulæ, I say, can hardly, or not at all, be discovered amongst the rough and vivid rash of scarlatina. It is only, therefore, when the rose papules are very distinct and well developed that we can expect to distinguish them positively in scarlatina; yet this may be done in no inconsiderable number of cases. But if the scarlet rash be fading, as is usually the case when the papulæ appear, then they are sufficiently distinct; and if we should see the patient for the first time at this stage of the disease, and particularly if the bowels happen to be loose, we should conclude that he was suffering from enteric fever, and such would surely be the correct diagnosis; but we must not, on that account, ignore the fact that a few days before, the disease was well marked scarlatina. A large number of cases of enteric fever may thus be traced back to their origin in scarlatina; and it is as incorrect as it is unscientific to divide the train of outward symptoms which constitute the phases of one morbid condition into two sets indicative respectively of two specifically distinct diseases—so regarded. All such classification puts an artificial line of demarcation where no real limit exists, and, for a time at least, effectually bars the advance of truth.

Excepting perhaps the flushed cheek, the mark of persistent abdominal irritation, there is no feature of enteric fever, which may not be observed in many cases of scarlatina; and conversely, a large number of patients who come under our notice for the first time suffering from enteric fever, will present the pallid face, the excoriated nostrils, the large red lingual papillæ and tonsils, the moniliform glands, and, occasionally, the aural discharge of a declining attack of scarlatina.

Again, some albuminuria is a common associate of scarlatina, but it may occur at any period of an attack of enteric fever. The urine of one of my patients who died of frightful sloughing of Peyer's patches on the 20th day, was loaded with albumen for four successive days before her death; and at page 571, vol. 1, of Reynolds' System of Medicine, I have given the history of another case in which albuminuria and general anasarca immediately followed an attack of enteric fever.

The intercurrence and sequence of scarlet and enteric fevers has been noted by several authors, and attributed to accidental coincidence. I believe that I have adduced sufficient evidence to satisfy an unprejudiced mind that it is due to a most intimate pathological relationship; in a word, that the pathology of scarlatina is precisely that of the first stage of enteric fever. In my article on "Enteric Fever," in Reynolds' System of Medicine, I have already expressed my convictions on this matter, and so strong were they at the time that work was publishing that I find I have in the proof sheet applied the term "Abdominal Scarlatina" to the contagious variety of enteric fever. I abandoned the use of the term at that time because it seemed to me that the evidence which I had adduced to show the connection implied by it was insufficient to convince those whose opportunities for examining the question in detail are rare, and whose scholastic principles would be shocked by such confusion of two diseases so universally regarded as specifically distinct. Now, however, that I am enabled to lay before the Society the full and complete evidence contained in the foregoing observations I will submit this term "Abdominal Scarlatina" to the profession as the appropriate definition of a disease which every intelligent practitioner will sooner or later meet with. Nor will I allow the opportunity to slip me, but in the interests of truth, as opposed to dogmas worthy of the dark ages, will ask my fellow labourers to go one step further with me, and discarding those transcendental ideas of enteric fever which make of it a specific disease dependent on one particular poison, open their minds to receive what experience will then soon teach them—that enteric fever, and all its attendant phenomena, may occasionally become a part of almost any other general inflammatory condition, specific or simple.—*Medico-Chirurgical Transactions, vol.* lv., 1872, *p.* 103.

4.—AN OUTBREAK OF ENTERIC FEVER AT THE VILLAGE OF NUNNEY, SOMERSETSHIRE.

[The following are the inferences deducible from the observed facts of this outbreak by Dr. Ballard, who has made a report on the subject.]

"1, That the fever in Nunney was enteric; 2, that it was brought into the village from a distant place by an individual whose evacuations, and those also of others attacked in the same and in the adjoining house, found their way into the Nunney brook at the upper part of the village; 3, that the fever spread in the village in consequence of the villagers habitually drinking the water of the brook thus contaminated, which water was still further polluted with the sewage of the village itself, containing, if not the actual excrement of the sick, yet certainly matters washed out of their soiled linen, and also more or less of their liquid evacuations; 4, that at the time of my visit, actual excrement from cases of enteric fever was finding its way into the brook at a hamlet only half a mile above the village of Nunney.

"The explanation above given of the origin and spread of fever in Nunney is confirmed by the sudden reduction in the number of fresh cases of the fever on the expiration of the week ending October 5. The causes of pollution of the water of the brook pointed out in the course of this report were still operating, but on and after September 24, water from an unpolluted source was brought in carts into the village daily for the use of the inhabitants. It could scarcely have been expected that the brook-water should at once have fallen entirely into disuse, that none of it should have been used by anyone in the village. Such changes are never to be effected suddenly. The result observed was just such and such only as I looked for. From eight to thirteen fresh cases had been coming under observation weekly for a period of five weeks; but in the week following the twelfth day from the introduction of unpolluted water, the weekly number of fresh cases fell to five, and in the next week to one."—*Medical Times and Gazette, Jan.* 4, 1873, *p.* 19.

5.—CARBONATE OF AMMONIA IN SCARLET FEVER.

By G. J. S. Camden, Esq., Rhyl.

The following treatment of scarlet fever has come down from master to pupil through four or five generations of medical men,—to myself from a partner I joined in 1828—therefore extending over a period of nearly 150 years. I was nearly losing a patient, when my partner told me if I persisted in treating scarlet fever *secundum artem* I should lose many. He then told me what he had been taught by his master, and had used for thirty years with the greatest success. I adopted his system, and am fully satisfied with the results. Never give emetics or aperients, nor bleed, nor use leeches, nor do anything to lower the power of life, but give ammon. carb. on the very onslaught of the disease, the earlier the better, when it will cut the disease short. I used it as follows :—℞. Ammon. carb. gr. x. vel gr. xij., aquæ ʒ iv., ʒ vj., vel ʒ viij.—for 16 years and above. ℞. Ammon. carb. gr. viij. vel gr. x., aquæ ʒ iv., ʒ vj., vel ʒ viij.—12 years to 16 years. ℞. Ammon. carb. gr. vj. vel gr. viij., aquæ ʒ iv., ʒ vj., vel ʒ viij.—6 years to 12 years. ℞. Ammon. carb. gr. iv. vel gr. ʒ vj., aquæ ʒ ij. vel ʒ iij.—4 years to 6 years. ℞. Ammon. carb. gr. ij. vel iv., aquæ ʒ j. vel ij.—2 years to 4 years. Unless distilled water be used it must be cold boiled rain-water filtered, the dose to be taken every two, four, or six hours, according to the severity of the throat symptoms; the quantity of water to be regulated on the same principle. The worse the throat the stronger the dose of ammonia, the smaller quantity of water, and to be given most frequently. The choking from the ammonia is instantly relieved by a small quantity of cold water, but if done without the better. If the power of life is at a low ebb, wine or a tea spoonful of brandy, and the same of water between each dose, and beware of aperients. I have waited five or six days. The foregoing prescriptions I sent to a lady in Ireland, who had seen the effect in eleven cases in her own house. In the original treatment in cases in which the tonsils had become gangrenous, the following was used as a gargle :—℞. Rad. pyrethri ℥ iij., aquæ ℥xvj., decoque ad ℥ x. et cola; adde syrup. rheados ℥ ij.—M. Gargar. sæpe utend. My partner used it whilst with me but once; I never used it, though I had one extremely severe case with gangrenous throat, through the nurse's negligence. There were twenty-two patients in the house—a school—and none died. I only used the ammonia and the brandy. In each case the child recovered. I never used leeches but once—the child being delirious—and then put on only two, and as soon as they came off stopped the bleeding. In my severe case ascites supervened, which nothing relieved. After several months in dread of paracentesis the umbilicus ulcerated, the cavity emptied, the child recovered, and grew a fine young woman. One great essential is the room kept cool and well ventilated.

Some few of my medical brethren have followed the treatment on my telling them, and were as much satisfied as myself; but most are incredulous. I never lost a dozen patients from scarlet fever in the course of twenty-five years, though I lost two in forty-eight hours in one house; but that was the abominable situation of it—the corner of a small wood into which the drainage from a large farm yard ran in close proximity.

About the year 1838 (I think) there was a letter in the *Lancet* in which the use of ammon. carb. in scarlet fever was mentioned as a new discovery by a German M.D. Since then two letters have appeared in the *Times* from Dr. C. Witt—one on December 1, 1858, the other I forget when. Of diphtheria I know nothing, but believe it to be only another phase of scarlet fever. Of the sequelæ you have less after the ammonia treatment, having seen but little; and, should anasarca supervene, it will readily yield, as I have of late years found (with alternate doses of quinine as a tonic), to liberal doses of potass. bicarb. (Howard's) with potass. nitrat. taken in a large quantity of water. The potass. nitrat. I use is to be obtained only at powder makers'. It has been melted by heat and kept so for two or three days, so that all water of crystallization is driven off. I mention this as I have always used it, and fancy I should not get a similar effect from any other. The sudden retrocession of the eruption I never knew to be of consequence; but the most severe and frequently fatal cases are usually those in which the eruption does not appear, and these cases are more frequent than is supposed, and are not suspected till too late. To my eye there is such a peculiar appearance of the throat it cannot be mistaken.—*Medical Times and Gazette*, *Feb.* 1, 1873, *p.* 131.

6.—A MECHANICAL THEORY OF FEVER.

One more addition has just been made to the theories which already exist of the cause of fever—that is, of increased bodily temperature. The most generally accepted fever-doctrine is certainly that which refers the condition to an increased production of heat within the body; but at the same time it must not be forgotten that such eminent authorities as Traube and Senator, of Berlin, would explain the elevation of temperature by a diminished loss of the same. For example, according to Traube, by spasm of the minute arteries of the skin, and the prevention of the cooling effect of the external air. The new theory might be called an extension of the one last named, and has been introduced and supported by Professor Hüter (*Centralblatt*, No. 5, February 1, 1873). According to this pathologist there may be an increased production of heat in fever, but there is a great diminution of the loss of heat, and that from an interference with the passage of the blood through the lungs. In support of this theory Hüter adduces the following ascertained facts:—The lungs of a frog may be examined microscopically in a living animal, and under these conditions the rapidity of the circulation through the pulmonary capillaries is so great that the individual corpuscles cannot be seen. If a septic or pyrogenic fluid be now injected into the blood of the animal the rapidity is remarkably diminished over large tracts of the pulmonary surface, although the circulation is never completely arrested. In the remaining portions of the lung the circulation is carried on at its normal rate—that is, the circulatory disturbances in the affected parts of the pulmonary tissue are not due to a diminution of the cardiac force or activity. What the cause of the slowing is, is difficult to say; but, according to Hüter, it is to be found in the adhesion to the vessel-walls of the colourless blood-corpuscles, and to the action of the septic organisms and the mechanical disturbances they induce. The correctness of these observations being allowed, and the fact being remembered that the blood is cooled at the pulmonary surface just as at the surface of the skin, it follows that the smaller the quantity of blood which passes through the lungs, the less heat does the body part with—or, in other words, the higher does the bodily temperature rise. Hüter believes that as he has observed under those circumstances half the superficial vascular surface cut off from the normally rapid circulation in the frog, only about half the normal amount of heat would be parted with—a condition which would amply account for elevation of temperature in a warm-blooded animal. The obstructions in the vessels may be one cause at least of the increased cardiac frequency in fever; and the circulatory derangements would also explain in part the parenchymatous swelling of the liver, spleen, kidney, &c., under the same condition. Altogether, Hüter contends that there is not a single true fever-symptom which does not become readily intelligible on this new theory of pyrexia.—*Medical Times and Gazette, March* 15, 1873, *p.* 278.

7.—TRANSFUSION OF MILK IN CHOLERA.

By Dr. Edward M. Hodder, Toronto, Canada.

Previously to the last advent of cholera, twelve or fourteen years ago, I suggested to my friend and colleague, Dr. James Bovell, the propriety and probable success of transfusion of blood. He at once met me with the objection, that the supply would most likely fail, inasmuch as few persons would like to part with their blood during an epidemic of the kind, and if they did we could not be sure that the blood itself was not diseased. This appeared to knock my scheme on the head at once, but I began to reflect, and to ask myself, What is the nearest analogue of the blood? and milk came to my mind. The next question to be decided was, whether milk had ever been injected into the veins of man or animals, and what was the result? I found that Donné had injected it into the veins of dogs, rabbits, and birds, and that it did not kill them, but, on the contrary, he, with Wagner, Gulliver, and others, were of opinion that the white corpuscles of the milk were capable of being transformed into red blood-corpuscles.

I then decided on the transfusion of milk into the human veins, should cholera pay us another visit.

At length the true Asiatic disease made its appearance, and found the City

Fathers as unprepared for it as if such a disease had never existed. Dr. Bovell and myself volunteered our services, and an old shed on the hospital grounds (used as a small-pox ward) was made the temporary cholera hospital. The first two or three cases were moribund when brought in; but the next day, about noon (the hour at which the medical officers of the hospital made their rounds), a stout-built farmer, who had come to Toronto on business, was admitted. He was in a state of collapse, cold, pulseless, blue, and shrivelled; the secretion of the urine was arrested; there were vomiting and purging of rice-water fluid;—in fact, he seemed dying.

I immediately got everything ready, and then sent a message requesting consultation with any of the medical officers who might be in the hospital, when four gentlemen came, and I asked them the following questions:—"Do you consider this a genuine case of epidemic Asiatic cholera?"—"Certainly, and a very marked one." "Do you think anything can be done to save him?"—"Nothing; he is dying." "Would any medical treatment be likely to be of any use?"—"None." "Then he must die."—"Yes." "Then, gentlemen," I said, "I am about to try the experiment of transfusing milk into his veins."—"If you do you will kill him," was the reply. Thereupon I invited them to be present at the operation, but three out of the four left the building; the fourth remained but would not assist. Everything being ready, I ordered a cow to be driven up to the shed; and, while she was being milked into a bowl (the temperature of which was raised to about 100° Fahr.) through gauze, I opened a vein in the arm and inserted a tube, and then filled my syringe (also previously warmed) and injected slowly therewith. No perceptible change, either for better or for worse, took place; so, after waiting two or three minutes, I again filled the syringe, and injected seven ounces more. The effect was magical: in a few moments the patient expressed himself as feeling better; the vomiting and purging ceased, the pulse returned at the wrist, the surface of the body became warm;—in fact the man rallied, and speedily recovered without a bad symptom.

The next day a woman, an habitual drunkard, was admitted in the same condition as the above described man. I transfused fourteen ounces of milk in a similar manner, and in a few minutes the vomiting and other symptoms ceased, and she improved; but towards evening collapse came on, when I injected fourteen ounces more milk, and she also recovered, but after secondary fever.

The third case was admitted almost *in articulo mortis*, but he rallied for a time, then collapsed, as the woman did, and died during my absence from the shed. Had I been present I should have injected more milk into his circulation, and he might have rallied again.

Dr. Bovell and myself then applied to the Corporation for a good cow, and a few articles indispensably necessary for the comfort and well-being of the patients; these were refused, and we thereupon sent in our resignations.

[It is to be regretted that this most interesting experiment came to such an untimely end, and we join in the wish with which Dr. Hodder concludes his letter, that it may be repeated here on a large scale should cholera ever visit England again. We scarcely know whether it is necessary to add, even for the information of English readers, that Dr. Hodder is a very distinguished and experienced practitioner, so that his evidence is most valuable and trustworthy. We would suggest, however, that it would probably not be necessary to take the milk direct from the cow; artificial warming would surely answer the purpose? ED. *Pract.*]—*Practitioner*, *Jan.* 1873, *p.* 14.

8.—ON THE RELATION OF GOUT TO URIC ACID.

By Dr. W. M. ORD, Assistant Physician, St. Thomas's Hospital.

In this country no one exerts probably so much influence upon the current ideas of gout as Dr. Garrod. No one has a better right to exert strong influence than the accomplished physician and chemist who detected the excess of uric acid existing as urate of soda in the blood, and has since by patient and conscientious observation put this and similar discoveries beyond the reach of doubt. The latest exposition of Dr. Garrod's views is presumably to be found in his article on gout in the first volume of the "System of Medicine" edited by Dr. Russell Reynolds (1870). At page 883 *et seq.* three propositions are offered:—

"1st. That it is essential to the production of this form of articular inflammation that the blood should contain an abnormal amount of uric acid, or rather of urate of soda; and even the phenomena which constitute irregular gout, or are regarded as gouty manifestations, demand for their manifestation the presence of the same salt in the circulating fluid.

"2nd. That gouty inflammation is invariably accompanied with the presence of urate of soda in the inflamed tissue.

"3rd. It can be shown that the amount of deposited urate is not in proportion to the intensity of the inflammation, and that in some structures the infiltration may ensue and scarcely give rise to any inflamatory action; facts tending to the supposition that the deposited matter may be looked upon as the cause rather than the effect of such inflammation."

In an earlier paper Dr. Garrod had spoken of the excess of urate of soda in the blood, and the deposit in the joints as pathognomonic of gout, in such a way that gout might thereby be decisively defined from rheumatism. The propositions, therefore, declare an advance in speculation. The urate of soda rises from a sign to be a *materies morbi*, and the deposit of urate in the cartilages and ligamentous structures of joints comes to indicate that these tissues are selected as agents in freeing the blood of the excess; certain joints being usually the first affected, and afterwards, "the blood still remaining impure from the presence of the salt, other surfaces" requiring to be "selected." As nearly then as possible gout here returns to its derivative meaning of a dropping (gutta) of morbid matter into joints. The excess of the urate is held to be explained partly by defective excretory power (the kidneys being in fault), partly by undue formation of uric acid in the system.

There is so much attraction for men's minds in the neatness of a compact hypothesis that this idea of the proximate cause of gout is apt to be carried away by a reader of Dr. Garrod's article with far less qualification than the author would probably desire. Indeed, he is careful to guard against the routine practice which would naturally follow upon the simple acceptance of the idea by pointing out that "each individual case not only exhibits its own peculiarities and becomes a separate study, but likewise demands in certain respects a separate treatment."

But even when this qualification is properly recognised, the conception of the cause of gout suggested in the above propositions is insufficient. It is still of first importance to regard gout as a mode of decay; to regard a gouty man as a man whose journey to the grave leads through definite regions of textural degeneration. The excess and deposit of uric acid are notable accidents of the way; are possibly efficient causes of much of what is most characteristic in the journey. But in errors of the entire process of nutrition—of primary concoction of the body, of concoction of introduced matters subservient to nutrition, of concoction of matters that have subserved nutrition and are to be removed—must be sought the explanation of that loosening and poisoning of the system to which, as I would urge, gout may be reduced.

Taking it to be a fact that uric acid is deposited in combination with soda within the joints of the gouty system, does this in the first place necessarily mean that the acid is poured out in order to free the blood of its presence? The sum of evidence seems to me against the necessity. Uric acid is universally allowed to be a product of the disintegration of the tissues or of the food; it is a substance of little solubility as compared, for instance, with the allied substance urea; and for this reason among others is not removable in large quantity from the blood by the kidneys; for the same reason, if formed within the tissues, it will not be removable in large quantity by the blood. Now, when we find a halo of fat round the margin of the cornea, a tissue nearly allied to joint-cartilage, we do not infer that the blood is too full of fat and that the cornea has been selected as an organ of elimination. All the language used respecting arcus senilis is on the contrary fitted to an idea of degeneration of the cornea having for one result the deposit within the corneal tissue of the comparatively insoluble matter, fat. When, again, we find crystals of cholesterine in an old sebaceous cyst or in an advanced atheroma, we similarly have suggested to us ideas of local degeneration and of immobility of the resulting substance. In the same way the presence of urate of soda in parts of the body remote from the centre of the circulation, in tissues of little vascularity and low activity, may be taken to be a mark of a certain kind of degeneration or want of organisation of those tissues, or of the juice thrown out from the blood for their use. Moreover the symptoms of general disorder which gouty patients exhibit may be taken to be a mark of a corresponding process of degeneration, or want of organisation affecting other organs and tissues under conditions which less readily permit the deposit or less hinder the removal of the urate. I have been speaking chiefly of first attacks. But the daily experience of gouty cases goes to connect every fresh attack with distinct exciting causes. A long walk, a wrench of a joint, a fall, violent nervous excitement or anxiety, an attack of indigestion, are so many examples of constantly recognised agencies. These have at least one condition in common—a disturbance of the circulation in some part of the body. The temporary congestions of the healthy man are represented by the characteristic inflammation in the gouty man. I may take here as an illustration the case of a gentleman who was for some years under my observation. By a superb disregard of all ordinary care in living he had engrafted a gout upon a constitution of far more than ordinary natural vigour. When I first saw him the feet and hands were already much distorted by gouty deposit, but the attacks of gouty inflammation chiefly affected the abdominal viscera—the intestines in particular. His mind was possessed with the idea that free purging was the true and only remedy for gout; and this remedy used for years, had brought him to such habit of constipation that nothing short of croton oil in large doses could now procure relief. After finding himself more than once at death's door through abdominal inflammations he consented to be treated with more gentleness; and at length, by the use of dilute saline solutions and enemata, the bowels were induced to act regularly and easily. Thereupon the abdominal attacks ceased, and his health improved. So long as he remained quiet his joints remained free from inflammation, but occasionally a long walk would be followed by gouty inflammation in the feet and knees. He died at last of severe gouty inflammation. Hurrying along one day in the city he tripped over a brewer's rope and fell full length upon the pavement. The shock was severe, but he speedily rallied, and was to all appearance quite recovered by the evening. But the next day he had gouty inflammation in nearly every joint of his body and in the membranes of the spinal cord. Under this combination he soon sank. His kidneys gave at no time any indications of congestion or impairment of function, and throughout my observations of him his attacks of gouty inflammation were always capable of explanation by local causes of excitement. And this I maintain is a constant experience in gouty cases. On the other hand, it is necessary to admit that uric acid is something more than a sign of gout, and is capable of irritating and causing inflammation of tissues. Like other chemical products of waste, it seems when present in too large proportion to hinder the functions and impair the nutrition of the tissues. And any cause which tends to pour an excess of urate of soda suddenly into the blood may thereby cause inflammation of parts already obstructed and of lowered vitality. The extension of gouty inflammation from joint to joint may be, in part, effected by the poisoning of the blood consequent on the rapid decomposition of the part first affected. I have certainly seen gouty inflammation set up in distant parts under circumstances which permitted the entrance of urate of soda into the blood from a part not at the time inflamed. A gentleman, aged now about 44, a sufferer from gout since his seventeenth year, has large chalkstones in the heels of both feet. These concretions have given rise to suppuration, but are so entangled with the living tissues that they cannot be removed; they remain therefore in the centre of large angry and painful granulations, and are a source of great distress. On three occasions I have applied solution of iodide of potassium to these with the double object of promoting their solution and of freeing them from the textural web. On all these occasions relief of local irritation has been followed by the establishment of gouty inflammation in distant parts. My own observations, indeed, accord with the facts upon which Dr. Garrod founds the statement that "the inflammation of the gouty paroxysm tends to the destruction of the urate of soda in the blood of the inflamed part." But it would be a necessary consequence of the greater flow of the blood through the affected part that much urate and probably much allied stuff should be at first swept into the circulation, even if afterwards, when the inflammatory process should have been established and the temperature of the part and of the body raised, much urate in the part and elsewhere should be burnt up. It is (I may remark) certainly the case that in violent gouty inflammation a sudden local formation of urate may take place. A gentleman, already too familiar with the course of gout, having been attacked one night with a pain in the ankle altogether exceeding all his former experience, applied on lint with a covering of oiled silk a mixture of equal parts of the liniments of belladonna and chloroform. When I saw him, two days after, the ankle was enormously swollen; there was extensive fluctuation over and below both malleoli; and a crown-piece area of skin was on each side discoloured and insensible. The skin giving way on both sides, a large quantity of thick dark fluid containing much decomposed blood, a little pus, and a large quantity of small acicular crystals of urate of soda was set free. There must have been at least fifty or sixty grains of the salt in about three ounces of the fluid which were caught on lint. The large formation of uric acid must here have taken place in the part, and was in evident relation with the severity of the inflammation. There was no such mitigation of the severity of inflammation in other joints as might have suggested that the uric acid was seeking an outlet at the ankle. They were indeed rather worse treated than was usual, and there was no notable, if any, subsequent relief of gouty symptoms. In illustration of the peculiar nature of gouty inflammation it is worthy of note that, even though the ankle had been as it were perforated, complete healing followed on both sides of the joint; and that the patient, a man of eighteen stone, was able to walk within three months, with the aid of sticks.

The extension of gouty inflammation, however, does not require the interference of uric acid for its explanation. As it is certain that in many cases simple inflammation is propagated from part to part by nerve influence, it is not illogical to assume that this may occur in gout. I have seen in several instances local inflammation like those of rheumatoid arthritis originate in local causes, and spread in a way that was more attributable to nerve influence than any other cause which I could imagine. One case in particular I was enabled to follow throughout its history. A lady, who had reached the age of 82, without failing in her intellect, senses, or muscular powers, and who lived an easy, well-regulated life, struck one day the metacarpo-phalangeal joint of the forefinger of the left hand a very sharp blow with a key. A pain as sharp as the blow followed, and the next day the knuckle was swollen and tender. The swelling became hard, the tenderness continued, and the pain extended up the arm, in spite of all kinds of local applications, including subcutaneous injections of morphia. The part had all the appearance of being affected with rheumatoid arthritis. At the end of a month the first joint of the thumb became similarly affected, and, later on, the wrist. At the same time as the wrist the first joint of the index finger of the other arm swelled up in the same way. Both hands eventually became almost useless. When a year had passed the hips and knees were swollen and fixed, making the poor lady a prisoner to her room. Finally, a slow invasion of congestion occurred in the lungs, and led to her death about eighteen months after the receipt of the injury. The case has been always for me typical as showing how, even if the several parts of the system be ripe for dissolution, the evil day is held off as long as no sufficient local excitement occur to fire the train. And the local cause here was one of much severity as regarded pain. There was so much suffering of a neuralgic kind in the knuckle first struck as to create a strong impression that some nervous structure, a twig or some large touch-corpuscle for instance, had been crushed; and in reviewing the case I have often thought that section of nerve, or the long-continued use of constant galvanic currents along the course of the nerve, might have kept the mischief from spreading. For the history leaves no doubt in my mind but that reflex nerve influence was the agency by which the local ailment became ultimately a general and mortal disease.

There remains one consideration of much importance in the more or less pronounced improvement of the general health which follows a fit of the gout. If it is true that the hopefulness of human minds has much exaggerated the extent of this improvement, its occurrence is nevertheless to be observed in many early attacks of gout. Dr. Garrod offers evidence that during the gouty inflammation "the blood loses to a great extent, if not entirely, the morbid condition which previously existed, and hence the disappearance of the malaise." It is already noted as probable that during the inflammation much morbid matter is burnt up. Where uric acid accumulates two important conditions commonly obtain—deficiency of arterial and stagnation of venous blood; and the parts where the accumulation is most common are parts that are much cooler than the rest of the body. Access of oxygen and rise of temperature may be readily conceived to favour the combustion of uric acid and similar matters. In the gouty system the various organs will always be to some extent charged with the products of their once incomplete or hasty decomposition. Now, it is a well-established doctrine in physiology that tissues are poisoned by the accumulated results of their own waste. If extractive of muscle be injected into the vessels of a muscle the subsequent application of ordinary stimuli will fail to produce any active contraction. But the muscle is only poisoned, not killed, and, if the vessels are well cleared out with water, will resume its power of active contractility. The feeble muscular power of cyanosis and the incapacity of continued exertion in the subjects of acute rheumatism belong to the same list. If in gouty inflammation a quantity of urate that has been poisoning certain tissues be removed, it is conceivable that those tissues shall give better signs of health afterwards. Moreover, in a few cases the gouty condition having been produced by temporary influences, the tissues may have sufficient vigour to nourish themselves better than before the attack, being freed from the obstructive matters. For, other things being equal, the nutrition of a tissue is active in proportion as the extractive is readily removed. Animals, for instance, fatten best and most healthily when freely supplied with water. It can be understood, therefore, how in a limited number of cases abatement of many local distresses, and even some improvement in health, may follow a sharp attack of gouty inflammation in a part.

But recurring inflammations proceed inexorably to damage the quality of all the tissues, and diminish their power of recovery even if freed from their incumbrance; and it is more than doubtful if the felicitations usually addressed to a man who, having been out of sorts, has a good fit of the gout, have any merit of appropriateness, excepting where gouty inflammation has been transferred from internal organs to an extremity. To avert local attacks and to hinder the extension of inflammation must be the aim of intelligent practice. In the accomplishment of the first object the old rules of regimen will still hold good. In the way of remedies eliminant medicines, among which pure water should hold a high rank, must be regarded as of high value; and to their use must be added the adoption of all possible measures to promote the concoction of healthy tissue, such as the use of cod-liver oil, of milk and fatty foods, and of good meats in moderate quantity, and the administration of tonics of various kinds, such as iron, arsenic, and the vegetable bitters. We must do all we can to wash away the offending extractive, and we must not neglect to make our process of repair and refitting as perfect as possible.

The foregoing remarks upon gout may be summed up as follows:—

1. Gout is a mode of decay of the whole system, marked by the deposit of urate of soda in and about joints, and by local inflammation of a particular kind.

2. The deposit of the urate is a result of local or general disintegration, and is not to be regarded as a means of eliminating urate from the blood.

3. The local inflammations do not necessarily depend upon the deposit of urate, and the deposit is not a consequence of inflammation; at the same time it is probable that excess of urate in the blood produces irritation of tissues.

4. The local inflammation is peculiar in respect of the ease with which it is produced, of the pain by which it is attended, and of the products, which are chemical rather than structural; chemical substance of low molecule, tending to crystallize or to be dissolved, being formed in the part, instead of substances

of high molecule tending to be organized. Interstitial subcrystalline deposit is common, suppuration rare, in gout.

5. The local inflammations are set going by local exciting causes.

6. The local degenerations and inflammations tend to infect the rest of the system through the blood, and to set up similar actions elsewhere through reflex nervous action.—*St. Thomas's Hospital Reports*, 1872, *p.* 228.

9.—ON THE TREATMENT OF LUMBAGO AND RHEUMATISM WITH ACTÆA.

By Dr. J. J. H. Bartlett, Surgeon to the Kensington Dispensary.

Actæa has for some time been known as a useful drug in the treatment of the different varieties of rheumatism; and the following observations were made in order to discover if there was any one symptom or chain of symptoms which indicated its use, as to whether the pain was made worse by heat or cold, increased by rest or motion, or felt most in the day or in the night.

The observations were made on twenty-nine cases of subacute chronic rheumatism and lumbago, and I regret to note that I have not found any one symptom or combination of symptoms which pointed out the unfailing utility of the drug, but at the same time the effects of the actæa on the above-mentioned diseases were very great.

The average age of the patients treated was 39 years 3 months.

Out of the twenty-nine cases, fourteen were suffering from lumbago, of whom eleven were cured; and fifteen were suffering from chronic and subacute rheumatism, of whom eleven also were cured.

In the twenty-two cases which were cured the pain was worse at night in 13; in the day in 9; when cold in 6; when hot in 11; when resting in 2; on movement in 20.

In the seven cases which received no relief, the pain was worse at night in 3; in the day in 4; when cold in 2; when hot in 4; when resting in 0; on movement in 7.

The action of the actæa in some of the most chronic cases was very marked; it appeared indeed to give relief at once.

The following are fair examples of its utility:—

Case.—May 27, 1872. S. W., a female, aged 40, was admitted a patient at the Kensington Dispensary. She has had pains in the loins for six months, which are worse in the day and on exercise; heat and cold make no difference. She cannot stoop or rise from her chair without great pain. Catamenia regular. Urine at times very highly coloured. Pulse, 96, regular. ℞. Tinct. actææ, ʒ ss., aquæ ℥ j, ft. haust., ter die sumend.

May 30. Pain is much better than it has been for months; she can now stoop with ease. She suffers from some headache after the actæa. Pulse, 84, regular.

June 6. Pain quite gone, but suffers a little from backache at times.

June 10. Quite well.

Case.—June 20. S. R., male, aged 60, was admitted a patient at the Kensington Dispensary, suffering from pain in the left lumbar region, which was of some weeks' duration: it made its appearance after an accident. The pain was worse at night when hot and on movement. Pulse, 76, regular. ℞. Tinct. actææ ʒ ss., aquæ ℥ j., ft. haust., ter die sumend.

June 24. The pain has shifted from the left loin to the left hip. Pulse, 88, regular.

June 30. Quite well: feels better than he has done for months.

The actæa was administered in the form of the tincture, the dose being ʒss. three times a day, except in the case of two children, T. W. and J. P. in which the dose was ♏x, and ♏xx., respectively increased to ♏xx and ♏xxx. In four cases the dose was increased to ʒj, but only one of these cases was relieved.

Unpleasant symptoms caused by the drug were noticed in six cases. They were, giddiness, headache, nausea, vomiting, and irregular pulse; these at once ceased on discontinuing the drug.

Diminution of the pulse has been mentioned as one of the effects of actæa, but I have not noticed this to be the case.

It is very important to use a freshly prepared tincture, as old preparations lose much of their efficacy.

I have also treated several cases of gout with actæa, but I have not found it of any benefit in these cases.—*Practitioner, March* 1873, *p.* 135.

10.—BLOOD-POISONING IN MAN AND ANIMALS.

By Nathaniel Alcock, Esq., Assistant-Surgeon 35th Regiment.

A farmer in the south-eastern part of Ireland had lost three cows from a sudden and inexplicable illness which terminated fatally in from twenty-four to forty-eight hours. No cattle plague existed in the vicinity, nor had he added any strange animals lately to his stock. A fourth cow, which presented no signs of the disease on Friday evening, was attacked in the night, and died on the day following. A veterinary surgeon was summoned, and the farmer, a young, healthy, and most intelligent man, opened the carcase for inspection. In so doing he wounded his right thumb slightly against a spiculum of bone, but proceeded with the dissection regardless of the scratch. No clue to the nature of the disease was found, except an enlarged and engorged condition of the spleen. All other organs were apparently healthy, and the veterinary surgeon thereupon pronounced the cause of death to be "splenic apoplexy." Among the lookers on at the examination of the cow were a sow, a terrier, and a greyhound, and when the spleen, which was fixed on as the offending organ, was cut up for minute investigation, they devoured the pieces that were thrown aside. On the following evening, about four o'clock p.m., the sow was found dead, and later on in the night the terrier also. On the next day (Monday) the farmer felt some pricking in the scratch, and was a little "out of sorts." On Tuesday he found himself "sickening," and had pain in the thumb, but still thought it would wear away. On Wednesday, however, he was in a high state of fever, and his arm had swollen considerably to even above the elbow.

He now sent for a doctor, who, recognizing the extreme gravity of the case, suggested a consultation, and I have been put in possession of the medical particulars by the surgeon who was then called in, and who subsequently brought me into personal communication with the patient. The swelling of the arm was very great, the axillary glands were much inflamed, and around the wound a vesicle of reddish serum had formed. Two similar vesicles had risen on the left arm, and a third on the chest. The distress of the patient was extreme, his pulse was very quick and weak, and he was evidently being rapidly poisoned. Believing that all treatment would be unavailing, it was agreed by the surgeons to try the effect of large and frequent doses of quinine. Accordingly, after the application of a poultice to the inflamed arm, quinine gr. v., with acid. hydrochlor. dil. ♏x., was ordered to be given every third hour.

On the afternoon of the following day they revisited the patient, and were inconceivably astonished to find him sitting up in bed, no longer anxious, but now assured of his certain recovery; the fever, and all other concomitants of blood-poisoning, were rapidly subsiding, and the local symptoms disappearing in proportion. The intervals between the doses of quinine were doubled, and the medicine continued.

On the ensuing Sunday, the fourth day of the treatment, he was up, and was soon after at his usual occupation.

The greyhound, the only survivor of the three animals that had eaten of the spleen, was found on enquiry to have been extremely ill, though but little cared for during the danger of its master; and, on being looked at, large dark spots like dried up bullæ were seen on the flanks and belly. It ultimately recovered. The disease continued still among the cattle, destroying in all ten cows and two calves.

Here, then, is an instance of a poison, communicable by infection from beast to beast, being transferred by inoculation to the human system, producing there the most violent symptoms of blood-poisoning, and yet being suddenly and unexpectedly neutralised by the introduction into the same system of quinine.

Dr. H. Thompson, Surgeon to the Tyrone County Infirmary, details in the Dublin Quarterly Journal the case of a medical man who in the discharge of his duties contracted typhus fever, which passed into the most severe maculated form with complete nervous prostration. On the eighth day his condition was considered by his professional brethren to be perfectly hopeless, as he was sinking despite the free use of stimulants and nutriment. In the early morning of the ninth day, quinine in three-grain doses was resorted to, at Dr. Thompson's suggestion, as an experimental measure. In consequence of some alarming excitement being produced, the attendant omitted the medicine after the second dose. On the morning of the next day it was resumed in five-grain doses every three hours. On the day following (the eleventh) decided improvement had taken place, and on the thirteenth he was out of danger. Dr. Thompson writes—"The resolution of the fever may be said to have been complete on the second day of the exhibition of the quinine, and on the thirteenth day of the disease, the change having commenced on the eleventh, which is not one of those periods commonly regarded as critical *in the natural course of the disease.*"

Thus in two distinct varieties of blood-poison quinine appears to have successfully antagonised the destroying virus; but whether it acts directly by catalysis, or throws a protecting shield over the vital elements at the expense of which the morbid matter carries on its enormous self-multiplication, remains for further research.—*Medical Times and Gazette, Jan.* 18, 1873, *p.* 60.

11.—ON LEAD POISONING.

By Dr. Francis E. Anstie, Lecturer on Medicine at Westminster Hospital School, &c.

[There is generally a period in which the patient simply feels unwell, without any more marked symptoms than foul breath, muscular languor, and occasional griping pains in the abdomen.]

Upon this there suddenly supervenes intense abdominal twisting pain, chiefly round the navel, perhaps vomiting, and complete obstruction of the bowels in most cases, though occasionally a partial action of the bowels continues. There is usually severe prostration, the pulse is small and tense, but generally not quick; often the pain causes cold perspiration to stand on the face.

When you are called to a patient in such circumstances you would inquire about his history. Even if you did not know that he had been exposed to lead poison, and even if he had not followed any trade directly predisposing to plumbism, you should still look further, because the metal might have entered his system in some less recognisable way. Especially you should examine his gums: lead poisoning nearly always shows itself by a bluish-purple line next the teeth and encroaching on them; it ceases where there is a gap from a tooth being absent. This sign, when present, is conclusive of the existence of metallic poisoning; and, under the circumstances, lead is much the most probable agent.

In dealing with this condition your first object is to allay the intestinal spasm, without which relief the peristaltic action of the bowel cannot be restored. For this purpose the best remedy you can administer is a draught containing half a drachm of ether and the same quantity of Battley's sedative solution with camphor mixture; this should be followed up by a large warm water enema. The draught may be repeated in an hour's time if necessary, and the enema should be repeated in two or three hours' time if the bowels have not been relieved; it should be thrown high up into the large bowel with a long elastic tube. Continuous hot fomentations should also be applied to the abdomen. By these means you will seldom fail to relieve the spasm and obtain evacuations. But if this does not occur in a few hours it is best to change the plan: you should now administer one-thirtieth of a grain of atropine hypodermically every three hours (for there is often vomiting in these protracted cases), and the constant current should be applied, about forty cells being used, the positive pole being placed on the navel and the negative inserted into the rectum. In this way you will pretty certainly relieve the spasm and obtain action of the bowels.

As soon as the attack of colic is over you must at once direct your attention to the removal of the poison; for lead is one of the few poisons the elimination of which we can directly assist by medicine. Iodide of potassium, in doses of ten increased to twenty grains, three times a day, effects a real elimination of lead by the channel of the urine. It is unnecessary to say anything about the precautions against continued introduction of lead into the system, since these will have been explained in the lecture on Toxicology.

The symptoms of the second grade of chronic nervous lead poisoning are as follows:—The muscles of the ball of the thumb are observed to become weak; sometimes they waste considerably before any further marked symptoms occur. To this follows a weakness of the extensors of the wrist, in consequence of which the hand cannot be freely bent back on the forearm. This generally progresses rapidly till the hand is helplessly dropped; and by this time there is usually great wasting of the fleshy mass on the back of the forearm. The supinators are usually also wasted and weakened, so that the patient cannot roll his hand outwards when resting the arm on the table. These affections of the muscles are commonly symmetrical, both arms being pretty equally affected. In some, but less frequent, instances the wasting and weakness affect also the muscles of the upper arm and shoulder. As a rule, sensation is but little or not at all affected. In extreme cases the affected muscles waste almost entirely away; in such instances the interosseous muscles of the hand also atrophy, and the peculiar *main en griffe*, more commonly seen in some other nervous diseases, is produced.

Now, for this condition we possess a singularly limited range of remedies. Our first efforts must be directed to the elimination of the poison, for which we must give iodide of potassium in the manner already described; at the same time we must order a highly nourishing diet and cod-liver oil in pretty free doses. The circulation in the affected muscles must be encouraged by prolonged and frequent frictions of the skin. If, however, these means do not very soon induce some recovery of power, we must not waste time, because there is danger of the atrophy reaching an irremediable degree. We must, therefore, at once commence electrical treatment; and, fortunately, in this we possess a most powerful remedy. In the first instance we should always try the induced current; both poles should be placed pretty near together on the affected muscles, each group being electrified for three or four minutes consecutively daily. Where the wasting has not gone very far the current usually excites contractions; but if after a few days' use we get no response to faradism, it is better to try the constant current. About forty cells will usually provoke contractions, except in cases where wasting has reached a hopeless degree; and after a few days or a week or two of this treatment we commonly find that irritability to the induced current returns; the cure may then be completed by faradism.

As an illustration of the extraordinary benefits sometimes caused by electricity, I may mention a case that some of you may remember. In 1870 a man, aged thirty-two, came to the out-patient department here, almost the whole of whose muscles of the right hand, forearm, upper arm and shoulder were atrophied to an extreme degree. The disease was singular in being confined to one limb; this was because the poison had been taken in only through the right hand, which constantly dabbled in the lead paints that he used in his trade. Here the constant current was used daily for eight weeks; faradaic irritability then returned, and in another month of treatment with the latter both the power and the bulk of the muscles were almost completely restored.

The third grade of nervous poisoning with lead represents that more profound influence of the poison in which the central nervous system is engaged. Most commonly it has been preceded by one or both of the stages already described.

Usually it is announced by the occurrence of epileptiform fits: these may either recur a number of times with intervals of comparative health, or the patient may almost immediately pass into a state of coma, from which recovery is very rare. It should be mentioned that this comatose condition is sometimes the precursor of death after an unusually severe attack of colic. There is generally very little to be done in the way of treatment when once the patient has entered on this stage of plumbism; but so long as he can be kept from actual coma, it is always worth while to persist in the use of iodide of potassium and cod-liver oil; a rather free use of alcohol is also advisable. As a subordinate measure, both for preserving the action of the skin and rousing the vigour of the nervous system, it is very useful to employ daily frictions to the general surface of the body. Constipation, where troublesome, should be met by persistent use of the constant current in the manner already described.—*Lancet, Nov.* 23, 1872, *p.* 733.

12.—ON RODENT CANCER.

By J. W. Hulke, Esq., F.R.S., Surgeon to the Middlesex Hospital.

Repeated examinations of the small hard knot or pimple, the precursor of the rodent sore, and also of the narrow hard border, have shown me that both alike are principally composed of masses of small roundish cells not unlike those of the rete mucosum, crowded together without intercellular substance, constituting a new tissue foreign to the normal tissues around it, intruding itself into them and wasting them, itself with their ruins undergoing destruction at a rate so nearly proportional to its renewal that its mass always remains small and inconspicuous. A tissue of this sort appears to have been found by Sir James Paget, and to have influenced him in rejecting with Mr. Hutchinson the rodent sore from cancers.

I cannot in this matter defer to these great authorities, for I have no doubt of the correctness of the view advanced and ably maintained by my former colleague, the late Mr. Charles Moore, that the rodent sore is a genuine cancer—an opinion, I believe, shared by all my present colleagues. The rodent sore we regard as a variety of epithelioma; with the most typical examples of this it is connected clinically by intermediate cases (the third I have brought before you to-day, marked by outlying smaller ulcers, and by a more coarsely granulating base, is such a one), and anatomically by the frequent presence in some parts of every phase of cell between those resembling the tissue of the rete mucosum and the large flat scales abounding in the most typical epitheliomata. The great predominance of the smaller cells has probably led to the intermediate forms being often overlooked. Mr. Moore, in his book on rodent cancers, refers to their presence in some of the cases which I had examined for him, and I have since too frequently discovered them to have any doubt of their occurrence. Our former Surgical Registrar, Mr. H. Arnott, a very acute observer, has also found such transitional cell-forms.

The important difference between rodent cancer and the other forms of cancer is its limited diffusibility. In itself and in its relations to the normal tissues it is as genuine a cancer as any, but it infects slowly and only continuously the tissues around it, and its whole course is free from that remarkable upspringing of large numbers of secondary knots, from the infection of the lymphatic glands and of distant viscera, which characterise scirrhous cancer. It is this restrictedness which renders rodent the least malignant of all, and makes its complete extirpation frequently practicable.

In hospital practice less frequently than in private you cannot accomplish its eradication by excision alone, because most of those who enter our wards do not seek relief in the very early stage, when the pimple or very small sore might be easily and cleanly cut out, but they commonly wait until it has become a large, often deep, and irregular sore, parts of which are inaccessible to the scalpel. However, in the first case I have related to-day, simple excision was practicable. This was done with the precaution of taking away with the sore a broad fringe of seemingly sound tissue. I was able to spare the extreme edge of the eyelid with its cilia. Had the raw surface thus made been left to heal by granulation, the scar would have dragged down and everted the edge of the lid and uncovered the eyeball. In order to avoid this I filled the gap with a flap of skin taken from the temple (adopting a plan very happily practised some years ago by Mr. Hutchinson). The immediate result has been very encouraging, and I hope the permanent one will not be less fortunate.

In the smith's case there were parts which the scalpel could not reach; and after cutting out the shrunken stump of the eyeball, with the remnants of the eyelids and all the hard border, the actual cautery was freely applied to the surface of the sore and wound; and when the bleeding had quite ceased the whole raw surface was coated with small pieces of lint smeared with an escharotic paste of chloride of zinc. This dressing was retained with a compress of cotton-wool and a few turns of bandage. Some of the wool was clipped away during the next few days, but the lint was not disturbed, and left to fall off with the eschar, which separated slowly. When at last it was exfoliated the wound was found already about a third cicatrised, excepting at the two small spots mentioned in the subsequent history already given. Those, too, as I there mentioned, were readily destroyed. It is likely that in the further progress of the case such little upgrowths may be repeated, but they can be easily dealt with. I do not present the man to you as cured and safe, with absolute immunity for the future, but the relief he has obtained is immense, and his prospects are incomparably better than when he first came to us in 1869.

Resuming the narration of the third case—the widow in Whitbread ward—the same practice was adopted, but her indocility and obstinacy proved insuperable obstacles to success. The destruction of the little boss of granulations at the root of the nose, which she had deluded herself was a sprout from which a new nose would grow, made her persistently reject any further surgical interference at that time. Other small outlying indurations appeared near the margin of the large ulcer; ulcerated and coalesced with this, and cancerous granulations sprang up at the inner side of the right orbit and crept into the frontal sinus. Even then I would have made a desperate attempt at eradication, but she would not submit to the necessary enucleation of the eyeball, not believing that this would in the progress of the disease be soon destroyed, and I was compelled to abandon her to her pitiable lot. The pain in her brow is now very great, and she has frequent retching seemingly not provoked by any injesta. I fear the infiltrating cancerous tissue has spread through the posterior wall ot the sinus into the brain. Even now there is no glandular infection and no cachexia. The cancer is strictly local. All that can be done is to keep the sore as clean and inodorous as possible with Condy's or some similar lotion, and to soothe her pain with opium.

To conclude, some of the lessons which these and many similar cases I could furnish from my case-books teach us are—

1. Not to think too lightly of small, hard pimples and warts in the face in persons advanced in life, but promptly and thoroughly to excise them, especially if they show a tendency to grow, ooze, and scab. Their complete excision, together with a broad fringe of sound tissue, will probably secure a future immunity. It is advantageous to close the fresh wound when large with a flap of sound skin from an adjoining part.

2. Never to try to destroy them with nitrate of silver, as is too often done, because its action is too superficial and its use seems often to hasten their progress.

3. When the surface of the ulcer is so irregular that complete excision is impracticable, it should be supplemented by freely burning with a hot iron those parts which could not be reached with the knife, and by the free application to them of the chloride of zinc paste.

4. Some apparently desperate cases at an advanced stage may thus be treated very successfully if the patients possess confidence and docility.

5. Such composite operations are well borne by persons in advanced years if care be taken to avoid much bleeding.—*Med. Times and Gazette, Jan.* 11, 1873, *p.* 27.

DISEASES OF THE NERVOUS SYSTEM.

13.—THE PRINCIPLES OF TREATMENT OF MIGRAINE.

By Dr. Francis E. Anstie, Senior Assistant-Physician to Westminster Hospital, Editor of the Practitioner, &c.

Migraine is a neuralgic affection, usually of the fifth nerve, and belongs essentially to the period of bodily development. Before passing to the question of its treatment, let me dwell earnestly on one or two important additional points of pathological history, which ought to exercise a great influence upon the direction of our efforts. It was first noticed, I believe, by myself, but the observation has been specially confirmed by Eulenburg, that sick-headache most frequently occurs in patients among whose ancestors *epilepsy* had made its appearance; and there are some remarkable clinical features of migraine which, when once they have attracted our attention, immediately recall some of the warning symptoms of epilepsy; namely, the tendency to sigh and yawn, but more especially the strong *shuddering* which is often experienced before the attacks of pain come on. I do not mean to say that a migrainous patient must at all necessarily have had a positively epileptic ancestor; but I think there is high probability that the essential groundwork of the migrainous disposition is an inherited imperfect organization of larger or smaller tracts of the medulla oblongata, and that it is a matter of what we may call accident whether the breakdown of nervous health takes the form of migraine, or of epilepsy, or of some other affection (*e.g.* asthma), which is merely allied to them, according as the morbid process affects chiefly the roots of the trigeminus, or the motor tract, or the roots of the pneumogastric, and so on. One of the most striking facts is the frequency with which we find, on careful inquiry, that persons actually suffering from some one of these forms of disease have previously suffered from one or more of the others. The influence which this doctrine of variable neurotic inheritance as a principal factor in the causation of migraine must necessarily exert in our ideas as to prognosis and treatment, must even now be strongly suggested to your minds, and I hope to make it very clear to you.

When you are called, then, to a patient suffering from attacks of migraine, do not allow the outlying phenomena, so to speak, to divert your attention from the central facts as to the pathology of the disease. It is quite possible that the sufferer may complain of the horribly depressing feeling of nausea as much as, or even far more than, of the pain itself; and your impulse may be, not unnaturally, to attempt the direct relief of that sensation by various remedies addressed to the stomach; as, for example, emetics or purgatives to remove some imaginary peccant matter; or, on the other hand, you may be tempted to try a strong cordial stimulant, such as hot and strong brandy and water. The latter might, indeed, give relief; but if so, it would act not on the stomach itself but on the medulla oblongata, upon which alcohol exerts a powerful influence. There are a great number of reasons, however, why it is exceedingly desirable *not* to give alcohol as a direct remedy for nerve-pain; and fortunately in the case of migraine there is no necessity for doing so, for all that alcohol could do can be better done by other things.

Before you decide on using any particular remedy, you should try to make a provisional prognosis, both as to the duration of the existing attack and as to the future nervous history of the patient.

Now, if the sufferer be a young person, somewhere between fifteen and twenty, and the malady has not been going on for more than a few months, you will probably learn that the attacks last for some hours, but that sleep quite puts an end to them, and next day, very likely, the patient scarcely feels as if anything had ailed him, the only reminder being a slight diffuse soreness of the scalp. Of course you wish to relieve his present pain; but is there a likelihood that the curtailment of one attack will in any degree tend to prevent or delay the periodic recurrence of the affection? Probably it will not do much in this way; for although in neuralgias, which are naturally of more frequent recurrence—returning daily or oftener—we may do most essential service by merely breaking the chain of attacks, we seem to have far less power to effect permanent good, in migraine, by the mere temporary arrest of pain. However, it is well worth trying to cut short the pain. The first thing you should do is to plunge the patient's feet in hot water containing a handful of mustard-flour, and let him inhale the steam that rises; the joint effect of warmth to the feet and of the inhalation of mustard-vapour will often produce drowsiness, and on lying down the patient will feel inclined to sleep. It is admissible to assist this feeling by the administration of a dose of chloral, 20 to 30 grains; but, unfortunately, this cannot always be tolerated by the stomach. Under these circumstances I still advise you to abstain, if possible, from forcing sleep by the use of opiates; and there is one important remedy which, in various forms, is available. The alkaloid caffeine (obtained from coffee), and the substantially identical theine (from tea), and guaranine (in the form of powdered paste made from the fruit of the *Paullinia sorbilis*), are each of them calculated to produce a peculiar effect in relieving the pain and enabling the patient to get repose. In a rough, but not fully satisfactory way, you may sometimes get these effects by administering strong tea or coffee; but much better is the administration of caffeine, in doses of one or two grains by the mouth, or one-half to one grain subcutaneously injected. Lastly, on the recommendation of Dr. Wilks especially, the guarana powder (which is practically a convenient form of impure caffeine) has been brought into fashion in this country, and promises to be exceedingly useful. I gave it, not long since, to a lady suffering from extremely severe migraine complicated with cardiac neuralgia; two of the guarana powders (now sold by all the principal London chemists), given at an hour's interval from each other, gave complete relief to the attack. If we are to believe Riedel and some other German observers, the use of caffeine will not merely give relief to individual attacks, but finally diminish the tendency to their return; this is a question, however, which requires to be further examined. If chloral be impossible, and caffeine or guarana has failed, we may even yet try one remedy—Indian hemp—before resorting to opiates; it should be given in quarter or half grain doses of a *good* extract, repeated in one hour's time if sleep be not induced. If driven to the employment of opiates, we should give one-sixth of a grain of acetate of morphia by subcutaneous injection.

We must do our utmost to bring about a radical change in the tendencies of the nervous centres. The first thing to be looked to is the patient's state of general nutrition, and you will often find much here that requires prompt interference. In a great many cases, indeed in the majority, the sufferer from migraine firmly believes that he (or *she*, for migraine is much commonest and most intractable among women) has proved to demonstration the unwholesomeness of all articles of food but some two or three, and of the general advisability of keeping to a semi-starvation allowance. Especially these people are afraid of taking any form of *fat;* they believe that such things are bilious, and specially likely to aggravate their complaint. Now, nothing can be further from the fact than these notions, in my opinion. You will never make much progress in the cure of the migrainous tendency till you have got your patient to eat and to digest a really good supply of nutritious food: and you will find that fat, so far from being specially objectionable, is particularly useful, as my colleague Dr Radcliffe first showed. Cod-liver oil is the best thing, if it can be taken, but very often the patient will not or cannot bring himself to touch it at first, so we must begin with very small quantities of Devonshire cream or plain cream, and so get on by degrees to cod-liver oil; and by the time that the patient has come so far as to take the latter to the extent of six or eight drachms daily, you will often notice with surprise how much less fastidious the appetite is with regard to miscellaneous articles of diet. Upon this soon follows a real improvement in the nervous symptoms: the attacks probably become less frequent, losing their rhythmical character, and when they do occur the pain is more tolerable, and seldom culminates in a burst of vomiting.

The effect of cod-liver oil is much aided by iron, as you might expect in cases where there is decided anæmia, the lips and gums being pale and the tongue marked by the teeth: it is best to give the saccharated carbonate in full doses, 10 to 20 grains three times daily. But I do not believe iron is any use in the majority of the cases which are not anæmic.

Migraine shares to some extent the peculiarity of all neuralgias of the first division of the trigeminus to be benefited by quinine: but I beg you not to fall into the common error of thinking that every periodic affection is to be treated with quinine. You may look on the practitioner who flies to quinine on every occasion when a nervous disorder shows some rhythmicality of recurrence as a probably ignorant person. As to migraine, most cases that are curable at all are curable rather by the tonic and dietetic plan above described than by quinine. Arsenic, however, does seem, in some anæmic cases, to act more efficiently than iron both in improving the blood-making process and in lessening the tendency to pain. And on the whole I am inclined, for the future, when quinine does seem indicated, rather to give a prolonged trial to caffeine or guarana, which appear to have a more decided influence than quinine.

In cases where migraine, without taking on any dangerous form, simply becomes converted into an ordinary trigeminal neuralgia without stomach complications, and with no regular periodicity, but coming on with severity on occasion of any great fatigue or shock, we have chiefly to trust to the influence of prolonged tonic regimen, and may indulge a fair hope that as the frame consolidates and grows strong, the affection will gradually wear itself out: such has been the course of events in my own case, and I know many other patients who are now scarcely ever troubled with a bad attack. For women, the entire change of life produced by marriage not unfrequently disperses the last remnants of a migrainous tendency; but, *per contra*, married life has certain dangers which may tend to revive the neuralgic disposition; such as pregnancy and (much more frequently) the depressing influence of severe labours with much flooding, or of lactation. Occasionally, indeed, we meet with an unlucky woman who, being a subject of migraine at the time of marriage, continues to suffer from it throughout the whole period of sexual life, with severe aggravations whenever any physiological crisis takes place: fortunately these cases are comparatively rare. On the whole, migraine may be described as a youthful neuralgia, tending for the most part to extinguish itself after passing through transitional form, but occasionally proving to be only the first symptoms of formidable diseases, such as epilepsy, asthma, angina pectoris, or facial neuralgia of the more violent and persistent type.—*Practitioner, Dec.* 1872, *p.* 348.

14.—ON CERTAIN FORMS OF VISCERAL NEURALGIA.

By Dr. Clifford Allbutt, Leeds.

[Neuralgia of internal organs has only lately received the attention which it deserves.]

Gastralgia is perhaps the commonest form of pain from which some neurotic patients suffer, and it really is so easy to distinguish from dyspepsia that one regrets the more they so commonly are confounded. Its occurrence in the persons I have described makes it scarcely necessary to add that it is far commoner in women than in men. I do not remember ever seeing it as a larval form of malarious disease. Our present physiological knowledge discredits its supposed connection with the cœliac plexus, and refers the seat of pain rather to the vagus; this, indeed, our clinical knowledge supports, for Anstie has shown that gastralgia often runs with angina and with asthma. It occurs mostly after the following fashions: sudden and violent pain may seize the gastric region, sometimes biting right into the epigastrium, sometimes darting through to the back, sometimes gnawing at almost all the sternal region, sometimes twisting and griping from the epigastrium round the false ribs to the left. The attacks may come on so suddenly as (in one case now under my care) to interrupt the sufferer in conversation and drive him into another room to writhe in secret, or they may come on more gradually and never reach any great degree of intensity.

In either case they have periods of greater and less severity, and of actual remission long or short. Pressure, as in colic, generally relieves rather than aggravates, and the attack passes off to recur at intervals which seldom seem to observe any remarkable constancy. With the sensory disturbances are often associated motor disorders. In one marked case—that to which I have already alluded—the stomach is the seat of volcanic movements of a flatulent character, as flatulence is associated also with abdominal colic. Twistings and irresistible gatherings of wind, which belch loudly from the throat, may accompany, follow, or replace the gastralgia, are dreaded by the patient as much as the pain, and are amenable to like palliatives,—to subcutaneous morphia, for instance,—while they set all alkalies, carminatives, antiseptics, and stomachics at utter defiance. In other instances some catarrh of the stomach is associated with gastralgia, as diarrhœa may accompany "interalgia," but this is less common. More common is vomiting, which may be spasmodic or may be a revolt of the hyperæsthetic stomach against the touch of the food. In the case of Sarah S., which I shall presently describe, the vomiting was a very prominent symptom. In some cases functional disturbances elsewhere seem not only to be an outcome of the same general habit, but to be directly consequent upon the gastralgia itself, though, of course, this is hard to prove. Irritable heart and wiry pulse, however, are very often associated with gastralgia in a way which seems rather direct than indirect. Asthma and angina seem rarely to have the direct but often the indirect connection, as they occur, not at the same time, but at different times, in the same person. Spasm of the abdominal walls is often present; perhaps we should always find it if we stripped the patient. The recti abdominis are knotted and the belly and epigastrium are nipped into hollows. This is mainly a reflex act, and the parts are at once released (as I have had occasion twice to notice) by a few whiffs of chloroform. "Points douloureux" seem scarcely to exist; certainly the epigastrium is rarely so tender as in dyspepsia and gastritis. Most persons, unless of a very vigorous and hard condition, have occasional tender vertebræ; and few women will not complain of differences in places when the spinous processes are successively pressed. The paroxysms may give way as suddenly as they came, or they may vanish slowly; the intervals are generally complete, or nearly so, but the motor disturbances may intervene and the interval be diversified by uncontrollable belching or capricious vomiting. Nausea, I think, is rare. Now, from what has gone before, it will be seen that the confusion between gastralgia and dyspepsia is not to be excused. There is no sharp pain from the epigastrium to the shoulders, consequent only upon injection of food, and relieved by vomiting or the prone position. The pain takes its own times of ebb and flow quite independently of digestion, for in some cases indeed food gives relief; not long ago I almost cured a gastralgi by advising a patient, who had been starved for dyspepsia, to go home and live as generously as he could for a fortnight. He was utterly amazed to find that, so far from being the worse for it, he was actually better and better. Nor are there any truly dyspeptic symptoms: the tongue is rarely coated; red at tip and edges it may be, but often it is of thoroughly normal aspect; nor do the other symptoms, as observed in the secretions, in abnormal vomits, risings, acidity, and the like, bear out the supposition of present dyspepsia. At the same time, the mucous membrane of these neurotics is often irritable, and may also be subject to intercurrent catarrh. In the vapourous neuralgics the tongue is frequently large, flabby and white at the back, the breath rather faint in odour, and constipation invariable; while, in the irritable neurotics, the tongue is nearly always small and often red at the tip and edges, the breath, however, being sweet, and the motions, though often constipated, yet often again running into diarrhœa. Bismuth with small opiate additions, or oxide of silver, are not uncommonly necessary in the kind of dyspepsia which may undoubtedly complicate gastralgia.

It is with unusual pleasure we enter upon the treatment of gastralgia, for, instead of admitting our weakness, here we are certainly strong. Individual cases may indeed thwart us; but, as a rule, we can hardly fail to bring considerable relief. The continuous current I have rarely tried in visceral neuralgias, and, gastralgia being so often a complaint of women, it is seldom convenient to make any local application of this remedy. The first step to be taken, after forming a diagnosis, is to assure the patient that his complaint is not dyspepsia but neuralgia, and to put him upon diet as liberal as the worried stomach will tolerate. This must be done carefully. There are to be no large full meals, but small quantities of light nutritious food at frequent intervals during the day. Rum and milk in the morning, a little meat for breakfast without much slop, a raw egg or a basin of soup at noon, a chop at the luncheon hour with a glass of sherry and vegetables in moderation, tea and bread and butter at five, meat and light pudding at half-past six with another glass of wine, and before bed a small cup of revalenta with a biscuit. Cod-liver oil will in most or many cases be required. And the patient, being released as to diet, must now be strictly warned as to the real causes of his ailment; anxiety in home or business, many important engagements, prolonged suckling, teaching in schools during hours due to relaxation, reading at night, social dissipations; all these causes of "wear" must be inquired into and disposed of. The next important indication is to administer such medicines as the case seems to call for on more general grounds. Anæmia, which cannot alone cause gastralgia, but often favours its manifestation, must be met by steel and aloes. I think Dr. Anstie has said that the tincture of the sesquichloride of iron seems to have a special power over neuralgia—a power which can scarcely be due to a mere improvement in the blood. This may be so, certainly in one case of obstinate frontal neuralgia with a white lock of hair, which was long under my hands, and in which everything, galvanism included, had failed; in this case large doses of the tincture of the sesquichloride succeeded better than any other remedy. But the same thing used to be said concerning the carbonate of iron, and probably with equal truth; so that the special virtue, if any, resides in the metal, and not in one of its salts alone. It would appear, then, that in iron we have two kinds of value; its value in ordinary small doses and in mild forms when it removes simple anæmia, and its value in large doses—doses such as half a drachm to a drachm of carbonate of iron, or of twenty to thirty drops of the sesquichloride tincture —when it seems, apart from the presence of any definite anæmia, to have a special effect in modifying the morbid state of nerve tissue. The same is true in some sense of quinine. This drug may be used in common doses of about a grain as a simple tonic, or in doses of ten to thirty grains as an anodyne. But I have here to refer to its use in the former way only, for large doses of quinine seem to have little palliative value in gastralgia, a fact which surprised me, seeing that the trigeminal centre and the vasomotor centre, over which they have such power, are close to the nucleus of the vagus. Probably, however, quinine governs trigeminal neuralgia indirectly through the intermediation of vasomotor change. Be this as it may, small doses of quinine with strychnine make a capital chronic medicine for gastralgia; but large doses, as rapid agents, in this ailment seem impotent. In the above combination the strychnine is, however, the more valuable element, and few cases of gastralgia get on altogether without it. It probably acts best when given under the skin; but, until baffled in other attempts, one scarcely resorts to this form of administration. In the few instances where I have thus tried it I have seen excellent results. Small doses should be repeated daily for several days, and the medicine carefully strengthened, if necessary, as its effects are seen. But of all the remedies for gastralgia arsenic is king, and to the use of arsenic I was led, when ignorant of its use by others, by noting the frequent concurrence of certain skin affections with gastralgia. Eczema, psoriasis, lichen, herpes, urticaria, all run with gastralgia in the irritable neurotics, and the eruptions generally occur in active, spreading, itching, hyperæmic, symmetrical forms. In gouty persons, on the contrary, they are generally circumscribed and chronic. Arsenic, then, has some remarkable power, not over skin affections in general, but as they occur in these neurotics; and it likewise cures or relieves their migraine, their tics, their asthma, their angina, their gastralgia, their colic, their capricious diarrhœa. Arsenic has not any specific power over skin affections merely as such, and hence the frequent disappointment of those who so use it; but it is a remarkable modifier of a certain peculiar constitutional habit, of which, probably by way of the nervous system, it obviates the morbid tendencies. I always prescribe Fowler's solution in any simple water, a dose of which, containing three to five drops of the solution, is taken largely diluted thrice daily with meals.

It should be carefully pushed to the edge of its physiological effects. The only palliative remedy of any importance is morphia used hypodermically, and of this I shall treat when I come to speak also of ovaralgia; of the lesser palliatives the best I think are ether and chloroform given internally in small doses. —*Liverpool and Manchester Medical and Surgical Reports*, 1873, *p.* 111.

15.—ERGOT IN HEADACHE.

DR. SILVER, of Sidney, Ohio, states in the Medical and Surgical Reporter, that ergot is better for headache than any other single article in the materia medica. He recommends it to patients who are subject to the malady thus:—℞. Squibb's fl. ext. ergotæ, gtts x—xx for one dose. To be repeated every half hour until relief is obtained, or four or five doses are taken. The primary effect of opium is to produce hyperæmia of the brain. To neutralize this action Dr. Silver employs with it fluid extract of ergot, and says the combination has a happy effect in cases in which opium alone would be contra-indicated by the fluxion of the brain. He does not regard ergot as a specific for headache, but thinks thousands of people are made miserable once a fortnight or once a month, who, by the use of it, may be made, for the time, comfortable. His experience with ergot in the headache of fevers is limited; but he would expect no good result from it, since the pain is then, probably, produced by the abnormal temperature and *quality* of the blood, instead of being occasioned by fullness of the cranial vessels, as once supposed.—*Medical Press and Circular, Feb.* 5, 1873, *p.* 119.

16.—ON SOME DISEASES OF THE NERVOUS SYSTEM.—SPASMODIC AFFECTIONS.

By Dr. SAMUEL WILKS, Physician to Guy's Hospital.

There is scarcely a nervous disease having an organic cause but may have its counterpart in a functional one, and be cured by galvanism or other means. I must make an exception in regard to contraction and spasmodic affections of muscle. These diseases, in my experience, constitute the most difficult to explain or to treat in the whole domain of clinical medicine. The physiologist has not yet determined the true relation of muscle to nerve, for we have on the one hand evidence of the power of contractility in the muscle when separated from the nerve, and, on the other hand, there is the fact of the muscle losing its tone in paraylsis, as seen in the muscles of the face when the portio dura is affected, and in the experiments of Marshall Hall already referred to. The dropping of the muscles of the face argues want of nerve influence, and the falling of the head in sleep the same fact, how are we to regard the case where a muscle is kept in undue contraction? An over nerve stimulation would be the most reasonable answer, for if the muscle relaxes when we become unconscious in sleep, we are bound to believe that we are sending a stronger volitionary force through the nerve, when by a voluntary effort we cause it violently to contract. In poisoning by strychnia we say the tetanic convulsion is produced by over excitation of the cord. We suppose the same occurs in tetanus, and in the convulsion produced by the irritation of a peripheral nerve. In tetanilla there is a paroxysmal excitation of the cord. In epilepsy it is the summit of the cord in the central ganglia which is thrown into excitation, and if the cause be an evident one it is found to be an irritant on the corresponding surface of the brain. If a tetanic condition be owing to an evident and tangible cause, it is found to be an acute meningitis of the spinal cord either resulting from injury or in the form of the epidemic cerebro-spinal meningitis. In an inflammation of this kind the whole phenomena of tetanus may be observed. The cord itself is healthy, but excited to overaction by the implication of the roots of the nerves, for there may be not only opisthotonos, but general rigidity of the limbs accompanied by pain in them and hyperæsthesia of the whole body. In spinal meningitis there is often exquisite pain on moving the limb, but whether this is purely muscular or due to an inflammation of the nerve is not very evident; sometimes in recent hemiplegia a painful contraction of the arm is observed. There is hyperæsthesia and hyperalgesia. If these symptoms have come on slowly we are still right in supposing that there is a meningitis, but that it is of a chronic character. Such cases are very common; cases where there is a commencing loss of power with altered sensation, and at the same time a rigidity of the limbs ending finally in their permanent contraction. The condition is explained by a chronic inflammation of the membranes of the medulla, including the roots of the nerves which are attached to it. In some of the most marked instances of contraction with only a partial loss of true spine function, a thickening of the membranes has been found. In such cases Charcot and his followers have diagnosed a sclerosis of the cord itself, but there has not been a sufficient number of cases recorded in this country to corroborate his statements. These cases are so chronic in character that they usually come to a termination in a private home or a workhouse, and thus the opportunity for examination is lost.

In the first case given below there can be little doubt that the symptoms point to an acute spinal meningitis. The next case is a similar one, where the inflammatory process has been a little more slow; and in the third where the legs are contracted a still more chronic and local affection has been present. If in such a case as the last we suppose the meningitis to involve only the lower portion of the cord, we can easily believe in a local meningitis of any other portion. Thus, in the following case it was a question whether a supposition of this kind should be made or the case be regarded as one altogether functional. A woman sent to the hospital by Mr. Lush, of Weymouth, had paroxysms of spasm of the flexors of the forearm causing contraction of the hands, and, at the same time, some apparent loss of power of the whole muscular system of the body. In all such cases an efficient cause is found in meningitis of the cord and its attached nerves, since post-mortem examination has proved in many instances that such a condition has existed with the symptoms above named. When, however, one limb or a single muscle is affected a considerable difficulty of explanation arises, and no clear idea is gained by saying that a child who suddenly gets a strabismus or a contracted leg is the subject of cerebral disease, or that a girl who possesses a spasmodically contracted arm has spinal irritation. The exact pathology of such cases has yet to be discovered, and it is very evident that there is a large field for research in the morbid changes of the nerves themselves, not only at their spinal origin, but throughout their course. One of the most common of these obscure affections is wryneck, as in a case I give below, where all means of cure were inefficient; an experience which corresponds I believe with that of most medical men. Sometimes the muscles of the jaw are affected and the spasm equally intractable. A medical friend has a patient with this idiopathic trismus, who is quite unable to open her mouth on account of spasm of the masseter, and who has taken a variety of medicines in vain.

In the second case given below it will be seen that although it was treated early there was no arrest of the disease.

In speaking of wryneck there is a fact worthy of observation and further investigation; that in young persons subject to this affection the head and face on the contracted side do not develop as on the other, and in consequence there is a want of symmetry in the countenance when narrowly examined from the front. One eye is slightly lower than the other, and the whole of that side of face and head is smaller than on the other. In a lad lately in the hospital with heart disease a wryneck existed from infancy, and this remarkable want of symmetry was very evident. In a young lady patient, also, who is otherwise well grown, this disproportion of the two sides of the head and face is well shown. It may be asked whether this is due to some failure of nervous influence having its foundation in the same cause which produced the wryneck, or whether the contracted muscle itself exerts an influence on growth, and, if so, whether the division of the sterno-mastoid would allow development again to proceed. I relate below the case of a man with wryneck, to show how little influence galvanism had over the spasmodic contraction. The fourth case is one of tetanilla, which I report in consequence of attention having been directed of late to this affection. There was a point of interest as regards diagnosis, for the case being attended by febrile symptoms a suspicion of meningitis existed rather than that the case was one of a simple spasmodic affection; as, however, the patient quickly recovered, the diagnosis must be given in favour of the latter.

Case 1.—*Acute Spinal Meningitis.* (Seen on Oct. 10th, 1872.)—J. F., æt. 12. Two weeks ago began to feel some weakness in his legs, which made him stoop when he walked. He was a quick intelligent boy, and, as a kind of amusement, he made himself some crutches, saying he must take to them. At the end of six days he was unable to walk, and had to keep his bed, and a medical man was sent for. He was then lying on his side, with his legs drawn up and complaining of pain in them. All these symptoms increased until I saw him on October 10th. He was then lying on his left side, with his legs drawn up, his knees to the abdomen and heels to buttocks. On touching his legs, or on attempting to move them he screamed out with pain. The muscles were hard, as if spasmodically contracted, and the tendons were rigid. The skin was also extremely sensitive, the hyperæsthesia extending all over the limbs and reaching as high as the umbilicus. Towards the back and over the lumbar region the sensitiveness was extreme. His condition was one of spasmodic contraction of the legs accompanied by pains. He had hyperalgesia and hyperæsthesia.

On inquiry about an injury the lad stated that on the 24th August he was playing with another boy, who was carrying him, when he fell off on to his back, striking himself on the kerbstone. He felt great pain for a moment, but this passed off, and he thought no more of it. He was ordered liq. hyd. perchlorid. and potass. iodid., with ice to the spine. He remained in much the same state as above described for a few days, with the exception of having regular attacks of opisthotonos, and then gradually grew better, and to-day (November 4th) the severe symptoms have mitigated, spasm being less and pain less.

Case 2.—*Chronic Meningitis.* (Reported by Mr. Wilkins and Mr. Nunez.)—Wm. B., æt. 10, admitted under Dr. Wilks, May 15, 1872. He stated that ten months ago he received a blow between the scapulæ which hurt him very much and required the advice of a doctor. He stayed at home for a week, being unable to walk on account of the pain in the back. He afterwards again went to school for eight months, but never lost the pain. Six weeks ago he began to lose power in his legs, and the weakness has gradually increased up to the present time.

On admission.—He was seen to be a well-grown boy, and did not look ill; he could not walk without assistance, being only just able to stand alone. His only symptom was partial loss of power. Sensation unaffected. On the supposition that some inflammatory process might have been set up by the injury he was ordered the liq. hyd. perchlorid. ʒ j, and potass. iodid. gr. iv, three times a day.

After four weeks he thought his legs were a little stronger, that he could move them better, and was able to stand. He continued his medicine, but at the end of another month it was evident that there was no real improvement, for he was beginning to feel pain in his legs, at the same time they were less sensitive and the muscles were beginning to be rigid. There was also some weakness of the bladder.

On July 9th he was galvanized. When a continuous current of thirty cells was applied to the spine, the arms were moved outwards, and the legs drawn up in jerks. Faradization to spine had no effect, and when applied direct to the legs the muscles did not respond.

At the beginning of September the spasmodic contraction was increasing so that he had a sand bag placed across his thighs to prevent them being drawn up. Continuous current been used daily to the spine. He was ordered gr. ¼ of ext. physostigmatis three times a day, and after a week it was increased to gr. ½. By mistake he took a double dose, 1 gr. He soon became very ill, and when the house physician was called to him an hour afterwards he found him with a clear froth coming from his mouth, perspiring profusely, his face turning blue, hands cold, numb, and almost powerless. Pupils of natural size. Pulse 130. Quite sensible. He had an emetic powder followed by warm water, and three hours after taking the pill he had quite recovered.

The above-named paralytic symptoms increased, at the beginning of October the legs being quite rigid, so that by lifting the heel the whole body could be raised, the knees were bent with great difficulty, but, if so, the legs suddenly contracted or flew up to the body. Sensation had also become much impaired as high as the sixth rib. Almost complete loss of power of bladder. Ordered succ. conii to see if it had any influence over the spasm, and he took it a few days, but with no result. It was observed that his abdomen was flaccid immediately after raising his clothes, but upon feeling it the recti became quite rigid. The same fact had been observed before in the legs, that they became much more rigid after being touched.

On November 1st limbs again tested by galvanism and faradization. The muscles responded to both, but their susceptibility was impaired, being much less than that of the arms.

Case 3.—*Chronic Meningitis.* (Reported by Mr. D. B. Lees).—James M., æt. 33, a sailor, had genital sore, but it is very questionable whether he has had constitutional syphilis. Six months ago, whilst in the Mauritius, he began to feel weak in his legs and to walk as if he were tipsy. The weakness gradually grew worse, and the limbs were beginning to contract when the doctor applied a red-hot iron three times on each side of the spine. No good result followed, and the contraction gradually went on, especially in the right leg. Whilst on shipboard he used to keep the leg forcibly down by a weight.

Admitted to hospital on October 21st. When placed in a chair he sat with his knees drawn up to his chin, his heels next his buttocks. The legs quite rigid, so that by attempting to extend one of them his whole body would be lifted up. The right leg, which was first affected, was more rigid than the left. The knees came together, although one was a little lower than the other. No pain over the spine. No difficulty with bladder. The muscles hard, extensors somewhat wasted, tendons rigid. He was placed under chloroform, when the left leg was readily extended, but the right could not be moved from its position. Tested with galvanism. On applying the continuous current to the extensors of the left thigh, and making and breaking contact, the muscles responded, but this was more marked when faradization was used, the limb then becoming nearly straight. The muscles of the right leg acted in the same manner, but with no tendency to straighten the limb. Sensation unimpaired.

Case 4.—*Torticollis.* (Reported by Mr. C. Knott.)—Alfred G., æt. 37, admitted February 28th, 1872, and left June 23rd. Works at oilcloth factory. Always enjoyed good health, and his habits were steady and regular. Never had any severe illness. Exposed to cold. About a twelvemonth since he found his head becoming gradually drawn to one side, his face looking to right shoulder, the muscles of the neck stiff, and some little difficulty in swallowing. This continued until admission.

Patient looks well, and whilst lying on his pillow his complaint is scarcely apparent, as he moves his head from side to side; but immediately he rises the left sterno-mastoid contracts, and his head moves to the right side.

Faradization was used to the left sterno-mastoid muscle, and caused marked contraction. This was continued daily, and after some time the muscle seemed more readily affected by a less strong current. It seemed, indeed, as well as the trapezius, to have greater excitability than the muscle on the other side. The continuous current from twenty Daniell's cells was then tried, and had no effect on the left sterno-mastoid, although it caused contraction of the platysma, whilst it produced the usual effect on the sterno-mastoid and trapezius of the right or unaffected side. The two forms were tried for six weeks, but without any permanent benefit, and were, therefore, discontinued. He was then ordered injections of arsenic for nine days, but without any result. He subsequently took bromide of potassium and then tr. cannabis, and on some days he thought he was better and the muscle more supple; but he again became as bad as before. A consultation then took place with the surgeon about the propriety of an operation for dividing the muscle or the muscular branch of the spinal accessory nerve; but the patient not approving the proposition left the hospital unrelieved.—*Guy's Hospital Reports, vol.* xviii., 1873, *p.* 185.

17.—ON CHOREA AND ITS TREATMENT.

By Dr. Willoughby Francis Wade, Physician to the General Hospital, Birmingham.

What is the best plan of treating ordinary cases? In the first place, knowing that some at least will get well if placed in suitable conditions, we have to say what conditions are suitable. Amongst the most important is a sufficiency of good, plain, wholesome food. Even more important than this, in my estimation, is rest in bed, which keeps the muscular and nervous systems in the greatest attainable repose, and thus prevents wear and tear; it also secures an uniform warm temperature. I prescribe two tablespoonfuls of compound decoction of aloes twice or thrice a day, as these patients are very often constipated; and an aloetic purgative is more likely than any other to bring away ascarides or joints of tapeworm, should any be present; and we know that worms seem to be sometimes the exciting cause of chorea. It is not desirable to produce much action on the bowels; and, to avoid this, it may be necessary to omit or diminish the medicine.

Under these circumstances patients often begin to improve very soon, and in not a few of them the improvement is continuously progressive. When this is so, I act upon that greatest of therapeutic maxims, "Let well alone."

One word upon the way to ascertain whether they are improving or not. I often see cases of chorea that, so far as I can judge from my own observation, are stationary, whereas the nurse assures me that they are much better. The nurse is always right. She sees them continually throughout the day. I see them for a short time only; and my speaking to them produces emotional excitement, and enhances their movements. Occasionally the converse happens; the visit produces a sedative effect for the time, and the patient seems better, though not really so. This temporary sedation is commonly followed by increased agitation. These are not the only cases in which you may get valuable opinions from nurses; and my advice to you is, never to neglect this source of information; and do not be affronted if the nurse tells you that the patient is worse since you changed his medicine, or otherwise disparages your judgment. You need not, of course, take all that a nurse tells you for gospel, but must exercise your wits in sifting the chaff from the wheat. In our present case, I learned in this way the interesting fact that the man's involuntary movements are greater if he gets fatigued.

If the patient do not begin to improve in a few days, or if his improvement be not continuous, it is, in my opinion, needful to do something more. There are certain drugs which enjoy a certain repute as controllers of choreic motions. The chief are preparations of zinc, of iron, and of arsenic. When I first came to this hospital I found chorea commonly, if not invariably, treated with sulphate of zinc, and accordingly adopted it. I begin, then, under these circumstances, with two or three grains of sulphate of zinc in water three times a day. Many cases get on very well without augmentation of this dose; but I will not affirm with positiveness that in such cases the recovery is not spontaneous. In a good many cases, however, it is evident that this dose is insufficient. If that be apparent, I increase it, and determine the amount of increase upon principles which have, at all events, the merit of being definite. Sulphate of zinc is one of those drugs which produce distinct effects if given to a healthy person. In a sufficient dose it causes vomiting, in a less one nausea. There are others, such as arsenic, quinine, belladonna, &c., which have what is generally styled a physiological, but which would with greater accuracy be termed a pathological, action on the human body. Now it seems to me that we may reasonably lay down the following therapeutic axiom.

Drugs which have a physiological reaction have not had a fair trial unless they produce either

a. Diminution of the symptoms or disease for which they were given ; or

b. Their recognized physiological action.

That is to say that, until they have produced their physiological action, they cannot be pronounced to be impotent to produce the intended curative effect. If the curative effect be produced, we have no desire to see any physiological effect ; which, indeed, we shall probably be much better without.

With regard to sulphate of zinc, I have repeatedly found slight physiological effects—viz., nausea coincides with distinct therapeutical effects, and a smaller dose is in rebellious cases inoperative. For example, the patient improves only when each dose produces slight nausea; and when the stomach has become inured to that dose, as it will in a few days, improvement ceases, to recommence so soon as the dose has been augmented to a nauseating quantity. It is surprising what a large quantity is at times required to satisfy this very plain and practical test, as we shall see directly, when we come to examine into our present case.

I should have mentioned that the dose sometimes causes a spurious nausea, due, not to emetic action of the drug on the stomach, but to the fact that the dose is disagreeable to the palate. Before discovering this, I was much puzzled by a case where the nurse told me each dose produced nausea, and yet the symptoms did not yield, as they soon did to a suitable dose. In our present case the patient, a man, is forty-five years old, and has been affected for twelve months. I have never seen a patient nearly so old as this, and I am not aware of any case in which simple chorea has commenced so late as forty-four ; though cases are recorded of women in whom, commencing about forty, it had lasted seven or eight years, making them at the end of that time older than our patient. He has been all the time in comfortable circumstances, and had not lost weight before admission, nor has he gained since ; we are therefore entitled to assume that his improvement is not due merely to improved circumstances, but may fairly be attributed to medicine. Twelve months was quite long enough to leave the case to nature to cure if she could, but she could not. His general health was good. The disease commenced in his feet, and gradually spread over his body, so that, on admission, his legs, arms, head, face, and tongue "danced," and had done so for many months. He was not confined to bed, as adults often rebel against such treatment, and I was anxious to keep him under observation; and I confess that it seemed to me more probable than it was a case of organic disease than of pure chorea, and that his chances of recovery were limited, for it is an undoubted fact that chorea may depend upon organic disease of the nervous centres. He was ordered two grains of sulphate of zinc in water, one grain to be added to each dose day by day—*i.e.*, on the second day he took three grains for each dose, on the third day four grains, and so on. Day after day, day after day, no amendment. The first time the nurse said she thought him a little better, was on the day that each dose contained thirty grains. The dose was still augmented, till he took two drachms in one day. No nausea was excited. But the bowels having become relaxed, as I thought possibly from the drug, I reduced his daily allowance to one drachm, and in twenty-four hours the diarrhœa ceased. Improvement, which was at first most apparent in the parts latest attacked, still continued, and he is at the present time much improved, though still not well, and I am still inclined to the opinion that the case is probably one of organic disease There is no sign or symptom of cardiac or arterial disease. Now, I have already said that, in my opinion, we may fairly connect the treatment and the improvement as cause and effect, and I think that so considerable a result in what may turn out to be a necessarily incurable case, in consequence of organic changes, speaks most strongly in favour of the efficacy of the treatment. There remains the question, Would a small dose have been equally efficacious with the large one ? I think not, firstly, because I have seen many cases where a large dose was needed to produce any sensible or obvious effect upon the symptoms ; secondly, because here no amelioration was discovered till the dose was, and for some little time had been, a considerable one. I should not have cared about the diarrhœa but for two reasons; one, because diarrhœa is a troublesome and unpleasant circumstance; the other, because it had been said that the continuance of large doses of sulphate of zinc may produce marasmus. If this be so, it is unwise to run the risk of such a result; and irritai on of the mucous membrane of the intestines, such as diarrhœa indicates, may certainly so destroy the absorbent power of the intestines as to induce marasmus.

This case, then, which is in many other respects so interesting, illustrates these four points.

1. Chorea does not always wear itself out and get well spontaneously.
2. Sulphate of zinc does exercise an influence over choreic movements.
3. The stomach and system at large will at times tolerate much larger doses of this drug than are commonly given.
4. Doses of unusual magnitude may be required before any curative influence is manifested.—*British Medical Journal, Dec.* 28, 1872, *p.* 712.

18.—CLINICAL ILLUSTRATIONS OF THE VALUE OF PHOSPHORUS IN CERTAIN FORMS OF DISEASE OF THE NERVOUS SYSTEM.

By Dr. W. H. Broadbent, Physician and Lecturer on Medicine, St. Mary's Hospital.

A method has recently become available by which phosphorus can be given in a form at once active and inoffensive, namely, dissolved in oil or lard, and enclosed in a gelatine capsule; the dose is about $\frac{1}{16}$ of a grain, and it may be taken two or three times a day, always after food. In the following cases this has always been the mode of administration.

1. *Severe Neuralgia with peculiar complication.*—The patient, a lady aged about 25, had suffered more or less from sick-headache or migraine from girlhood. After her marriage she had children rapidly, and being weakened in consequence, the attacks had become more frequent and violent, and had changed somewhat in character, having assumed more the character of distinct neuralgia of the first division of the fifth nerve, which, as Dr. Anstie has pointed out, is a common transformation. Change of air afforded relief from the attacks for a while, but as soon as she had been a short time in any place in England they began to return. She enjoyed a more complete immunity when at sea or abroad, and during two or three journeys to the Orkneys, and in one to Malta, Egypt, and other parts of the Mediterranean, and for some time after her return she had not a single attack. In November 1872, however, she was suffering more than ever: she scarcely had a day free from pain, and twice a week, or even more frequently, was prostrated by a severe attack. These began with pain in the brow, extending over the side of the head, and then shooting into every limb. Usually there was violent retching, but not always. After the violent pain she was left in a state of extreme prostration, almost amounting to insensibility, which lasted for the remainder of the day.

A complication had been gradually coming on, which she called indigestion. There was some gastralgia, but what she most complained of was, that on beginning to eat she lost all power of attending to what was said or done, and became unable to take part in, or even to follow, the simplest conversation. This was worse at lunch than at dinner, and had become so bad that she was compelled to withdraw from all society at this meal, eat it alone, and then lie down; she was beginning to be afraid also of dining with friends. The neuralgia had been treated in various ways, but for some little time she had been allowed to diminish the quantity of food on account of the dyspepsia, and she had taken carbonate of potash for the relief of discomfort attributed to acidity. I attributed the mental confusion at meals to cerebral anæmia, caused by diversion of blood to the gastric mucous membrane for the work of digestion, and explained the lesser degree of this at dinner than at lunch by the fact that the food taken at the earlier meal had become available for the support of the nervous system at the latter.

Of course it was necessary here to do more than give drugs. I ordered breakfast to be taken in bed, and to be followed by some repose; at 11 or 11.30

a.m. a cup of strong beef-tea; the luncheon to consist chiefly of meat, with Burgundy or porter; milk with cocoa to be taken instead of afternoon tea. Dinner needed no special regulations. A little beef-tea was to be taken at night. The phosphorus was ordered to be taken twice a day with a teaspoonful of cod-liver oil, after lunch and dinner.

Four days after the commencement of this treatment the patient was entirely free from pain, and so remained for three weeks, when, according to my directions, the phosphorus was to be suspended for a week. She was at this time entertaining a large party at her husband's country house, giving dinner and ball. In three or four days she began to have neuralgic twinges, upon which she at once resumed the phosphorus, which she still takes with occasional intermissions. She has had no attack now for more than three months, which is unprecedented in her experience, and she is better in all respects.

2. *Nervous Break-down from over-work, &c.*—Another case, of a different character, is that of a gentleman aged about 35, a merchant. He lives a short distance out of town, going into the city daily. Unfortunately several unfavourable hygienic conditions are concentrated round his residence. The soil is clay; the house is near the foot of a hill, and on the wrong aspect, so that in winter it is reached by the sun for a few hours only on the finest day. It will be easily understood that a winter such as that through which we have just passed, which has been remarkable for long-continued prevalence of wet weather, was especially trying in a situation naturally damp. Near the end of November one of my patient's children had typhoid fever, which gave him much anxiety and caused him loss of rest; it robbed him also of fresh air and exercise, and kept him much in the house. Under this he broke down; his sleep had for some time not been very good, and he now lay awake almost the whole night. He was often giddy, had severe pain in the head, and the top of the head was always hot; he frequently had palpitation of the heart, tightness of the chest, and a sense of impending syncope; felt destitute of energy, and unable to give his attention to anything, the least effort in this direction giving rise to a painfulness in the head, and throbbing sensations. He often felt feverish in the night, and perspired rather freely towards morning; but the temperature, which was carefully taken by the patient at various times, was never above the normal standard. The appetite was not good, but he was able to take a fair amount of food; the tongue was furred; the bowels rather confined. Pulse soft, compressible, and quick or sharp. Pupils very large.

The symptoms were those of nervous depression, and were such as often accompany, in a greater or less degree, atonic dyspepsia, and what we are accustomed to regard as derangement of the liver. Dyspepsia and its discomforts were, however, not prominent. I first prescribed an aperient and quinine, which was pushed to doses of six grains. It was necessary to procure sleep, and for this purpose chloral was given, but with very inconstant effect, and occasionally an opiate was required. Iron was shortly added to the quinine, and for a time small doses of pil. hydrarg. and ext. colchici, with pil. rhæi co. and ext. taraxaci, were given at night. He was a little better for this treatment. I attached most importance, however, to change of air, and sent my patient and his child to Hastings for a fortnight. He soon began to enjoy better rest, but, though much benefited, did not derive all the good I had expected from his visit. This was partly due to an unfortunate chapter of accidents. He was kept awake one or two nights by storms; was alarmed by an attack of vomiting and diarrhœa, with high temperature, which was induced in his little boy by an imprudence in food; and on another occasion he over-exerted himself and brought on an attack of palpitation, by hurrying to escape a shower. On his return he attempted to resume his work, but notwithstanding great care and shorter hours of business, he began at once to suffer from his old symptoms—headache, oppression, low spirits, want of energy, palpitation, &c. I was particularly struck with the character of the pulse, which was that of extreme arterial relaxation, the pulse-wave being sudden and short, the artery in the interval perfectly flaccid. I now gave strychnine and iron, and as I considered that the want of vascular tone was not only an indication of nervous weakness, but in itself a source of mischief, I added ʒ ij of infusion of digitalis for the purpose of inducing contraction of the muscular walls of the arteries. He was better, and was able to go to his office, but had frequent headaches, remained entirely destitute of energy, slept badly, and on any excitement had a return of his old symptoms in full violence. Both his friends and he himself were becoming alarmed, and it seemed as if nothing short of a prolonged absence from business, which would have involved serious sacrifices, would restore him to health. I now began to give the phosphorus capsules, at first one, then two per diem, after meals: this was on January 18. From this time he gradually improved, and when he reported himself on March 3, said that for a fortnight or three weeks he had felt all his usual energy, and had ventured to put himself in the hands of his dentist, which had cost him two or three nights' rest. He had not, however, altogether recovered his usual healthy appearance. On March 17 he was still better, both as to strength, energy, and looks, notwithstanding unusually trying circumstances.

I have now under my care a lady suffering from atonic dyspepsia, with low spirits and apprehensions of all kinds. When I first saw her she indulged in a fit of weeping before she could tell me what was the matter with her. · Here I gave, in addition to the strychnine and acid, which I find most useful in such cases, a phosphorus capsule once a day. and the improvement has been much more rapid than is generally seen.

I have also given phosphorus with obvious advantage in cases of syphilitic disease of the brain giving rise to epilepsy, after a course of iodide of potassium in large doses; this remedy often leaving the nervous centres in a weakened condition.

I do not pretend to explain the action of phosphorus. The popular *rationale* is, that as phosphorus is found in the nervous structures, the beneficial effect is produced by supplying this element for their nutrition. We might with equal reason try to live on charcoal because carbon is a constituent of the tissues and its oxidation a source of heat. The influence of phosphorus and arsenic on the nervous system is analogous to their influence on the nutrition of the skin, which is seen not only in the case of cutaneous skin diseases, but in the production of zoster by arsenic. Carried further, the same action produces the granular change in the muscular and glandular structures seen in cases of poisoning by these substances.

It has often occurred to me to hear it proposed to give phosphorus in the form of phosphoric acid. The absurdity of this will be seen, if we substitute sulphur for phosphorus, and speak of using sulphur and sulphuric acid indifferently.—*Practitioner*, *April* 1873, *p.* 230.

19.—THE HYPODERMIC INJECTION OF STRYCHNIA IN PARALYSIS.

By Dr. William Carter, Physician to the Liverpool Royal Southern Hospital.

Among the methods of treating local paralysis, that by the hypodermic injection of strychnia deserves careful attention. In the following case, there was at first general paralysis, with greater loss of power in one part, however, than elsewhere; and this part continued paralysed after the rest of the body had regained much of its normal strength. It may to some extent, therefore, be considered a local paralysis; and the effect produced on it by the hypodermic injection of a concentrated solution of strychnia was very satisfactory.

S. D., æt. 37, was admitted to the Southern Hospital, under my care, on Dec. 17th, 1871, suffering from general paralysis. Thirteen weeks previously, she had been confined of her eighth child. Everything went on well, till at the end of the third week, when she walked out. During this walk, which was in the evening, she got wet, and on the next morning was suffering from pains in the back of the neck, and so much dorsal stiffness as to render her unable to stoop. She applied turpentine to her neck, which became better; but during the next three weeks she found that day by day she was losing power in her limbs; and the weakness became at length so extreme, as to render her incapable of any exertion, and to compel her to come to hospital.

When admitted, she had the appearance of a healthy, well-nourished woman, but was suffering from all but complete loss of power in all her limbs. Though all the extremities were paralysed, the left arm and hand were certainly the most helpless. She could just manage to move the legs, and to raise the right arm slightly from off the bed; but the left one lay perfectly motionless, with the hand in a prone position; and she was unable, by any effort of will, either to raise it in the slightest degree, or to effect the least amount of supination. There was little, if any, loss of sensation. The diaphragm and intercostal muscles acted well in respiration. On examining the spine, there was found to be a great deal of thickening at the lower part of the neck, which she said had only been present since the commencement of her illness. There was no tenderness anywhere on percussion, nor was any pain caused by passing a hot sponge down the spine. Heart and lungs healthy. Pulse 90. Bowels constipated; urine scanty. One drachm of Easton's syrup of the phosphates in water was ordered three times a day; and, as the usual house medicine produced no action of the bowels, a powder was given, containing five grains of calomel and fifteen of jalap, which had to be repeated again and again at intervals during the first few weeks of treatment. The left arm was also ordered to be galvanised by means of the induced current for ten minutes twice a day.

Dec. 22. The note for the day describes her as being "much better; more motions in the arms and fingers; tips very sore. Complains of twitching on falling asleep, in consequence of which she is sometimes unable to sleep."

On Dec. 29th, as the left upper extremity continued very helpless, the nail of the fourth finger on either side was stained with nitric acid, with a view of ascertaining from the relative rapidity of their growths whether the nutrition to the matrices was equal.

On Jan. 3rd, 1872, there was a clear interspace at the lowest part of the right nail, which, by Jan. 5th, had increased a good deal; the nail of the left hand not presenting the least evidence of growth.

On Jan. 12th, she is said to be "very much better; walked twelve steps alone; was up for an hour and a half; the left arm still very helpless; supination impossible on the left side; easily effected on the right; sensation complete on both sides." As the left arm continued so helpless, one twenty-fifth grain of strychnia in solution was on this day injected into it, the mixture being continued as usual. This produced no apparent effect.

On Jan. 17th, therefore, double the quantity was injected over the outer condyle of the humerus, near to the point of division of the musculo-spiral nerve, into its radial and posterior interosseous branches.

On the following day, she is said to have had some slight power of supination; and the bowels, which had ever since her admission been obstinately constipated, are said to be acting regularly.

On Jan. 22nd, the injection was repeated.

The power of supination was increased on Jan. 24th, on which day a further injection—this time of one-tenth grain—was made.

This was repeated on Jan. 28th.

On Jan. 31st, the bowels are said to have acted daily for a good many days past without the use of purgative medicines.

No inconvenience having been experienced from the injection of one tenth of a grain, the amount was still further increased, on the 5th of Feb., to three twenty-fifths of a grain. Slight cramp of the legs followed this.

It was, however, repeated on Feb. 7th, without being followed by cramp; and again on the 12th and 16th, on which last day its employment was discontinued, the condition of the arm all the time rapidly improving.

By the middle of March, she could walk four or five times along the corridor without assistance; and having continued steadily to improve, she was, on the 24th of April, dismissed.

At the time of her discharge, the following note was taken:—"The left deltoid a good deal less than the right; the left arm can be abducted a foot from the side; supination can be performed readily, and everything grasped between the fingers, though there is slight numbness in these. The hand can be raised as high as the nose. The power of using the right arm is perfect, though there is slight numbness in all the fingers. She can walk well. There is some pain over the last cervical vertebra. The thickening at the lower part of the neck posteriorly is undiminished."

In the second volume of the Trans. of the Clinical Society of London, some interesting cases are detailed, by Mr. Barwell, of local paralyses in children benefited or cured by the hypodermic injection of large doses of a concentrated solution of strychnine. Mr. Barwell thinks that, when a concentrated solution is hypodermically injected, the effects are more local than when it is more diluted; and that, consequently, what would at first sight appear to be dangerous doses may be thus administered without the system generally being injuriously affected.—*Liverpool and Manchester Medical and Surgical Reports*, 1878, *p.* 38.

20.—ON THE HYPODERMIC USE OF STRYCHNIA.

By Dr. J. J. Chisolm, of Baltimore.

Dr. Chisolm states that he is in the daily habit of using strychnia by hypodermic injection in nervous affections of the eye, and although the results are not always strikingly beneficial, in no case have they been injurious. He has found that by increasing daily the quantity injected, a much larger amount than is mentioned in books may be administered with good results. He formerly commenced with the one-sixtieth of a grain, and slowly increased the dose to one-thirtieth, but he now usually commences with one-fortieth of a grain. The strength of the solution he uses is 4 grains of sulphate of strychnia to one ounce of distilled water, each minim containing the $\frac{1}{16}$th of a grain of the alkaloid. He usually commences the strychnia treatment by injecting three minims of the solution, equal to one-fortieth of a grain. If no marked symptoms of poisoning ensue, he increases the amount of the solution every day by one minim, until a maximum dose is reached, which is frequently one-sixth, and often one-fifth of a grain. In one case, one-fourth of a grain of sulphate of strychnia was injected at a dose, and continued daily, without causing any special annoyance. In some cases Dr. Chisolm has found that good results are not attained until large doses are reached. When the dose of strychnia has attained its maximum, that is to say, as much as can be comfortably borne, it should be steadily persevered in at this strength as long as any improvement shows itself. He states that he has continued the injection of one-sixth of a grain doses for three months, but he gives a warning that, as with all potent medicines, cases will now and then be met with in which even the commencing dose of one-fortieth of a grain will prove too powerful, and he has heard of a case of marked idiosyncrasy, in which one-fiftieth of a grain of strychnia, used hypodermically, caused convulsions and insensibility, which lasted several hours. He himself had a case in which, the patient being a young lady of nervous temperament, an attack of convulsions of short duration was brought on by the use of one-twentieth of a grain. The place where the injections is practised is of no great importance, and in the cure of eye and ear diseases there is no advantage in injecting the solution near the affected organ, as the remedy acts only on the nerves of sight and hearing through the instrumentality of the nerve-centres and by means of the circulation. The most convenient place, according to Dr. Chisolm's experience, is the loose skin near the outer surface of the shoulder, or in the outer and upper third of the arm. Care should be taken not to inject more than the quantity required, and accidents may be prevented by not putting into a syringe more than the medicinal dose. The cases in which Dr. Chisolm has found the hypodermic use of strychnia most serviceable are hemeralopia, muscular asthenopia from overwork, amblyopia, and tobacco amaurosis.—*Med. Chirurg. Rev., April* 1878, *p.* 499.

21.—ON THE THERAPEUTICAL USES OF GALVANISM.

By Dr. Samuel Wilks, F.R.S., Physician to Guy's Hospital.

It must be generally admitted that the therapeutical uses of galvanism have received a fresh impulse since the introduction of the continuous current into practice. Until a few years ago the only method in use, except frictional electricity, was that of faradization. This was sometimes beneficial, but as often quite valueless, so that galvanism was either indiscriminately recommended in all forms of paralysis, or was systematically neglected. A very different feeling, however, prevails at the present time, for we are beginning to discern in what cases faradization is useful, and in what cases it fails; more particularly has it been noticed that it is in those very cases where faradization has been useless that the continuous battery current has been so fruitful of results. We some years ago introduced into our electrifying room a large battery in which any number of cells up to 100 could be combined, and with this instrument we have witnessed a success in many cases which scarcely could have been anticipated. We have a large number of patients daily being operated upon, and two or three attendants constantly employed either in the room or in the wards. It has not yet been satisfactorily determined why one form of galvanism should fail to stimulate a muscle and be useless as a remedy, whilst another form excites it to contraction and is curative. This may be dependent upon the condition of the muscle or of the nerve which supplies it, or the centre whence the nerve springs; at the present time the facts themselves are not sufficiently established, but when they are so we shall be able to use them as a means of diagnosis. All I shall attempt to do here will be to state some of the facts we have observed, and thus offer a small contribution towards the material out of which some more important conclusions may be eventually framed.

In the first place, we had no sooner possessed our battery than we discovered its marked value in cases of simple paralysis of the limb. In these cases faradization often fails to produce the slightest effect, whereas the application of the continuous current immediately excites the muscles to contraction, and eventually brings about a cure. A good case of the kind I give below. Then, again, in various forms of paraplegia, its good effects have been most striking. As I have before said, it is most difficult to ascertain, in various forms of paralysis, whether an organic disease of the cord exists or not, seeing that all the symptoms which attend it may occur in the case which is functional and curable, and therefore it is true that galvanism has been used in many cases and failed; but, on the other hand, we have had a variety of cases which may be included under the term paraplegia, where a complete cure has been effected by applying the current to the back. In some cases of locomotor ataxy I have witnessed perfect recovery, both in hospital and private practice; also in cases of commencing progressive muscular atrophy. In paralysis agitans I never saw much good done by faradization or any other remedy, but in a case I mention below it appeared as if much benefit might accrue from the use of a continuous galvanic current down the spine. In no case is the effect of the continuous current to the limb so remarkable as in the atrophic paralysis from lead, two examples of which I shall presently relate. The fact has now for some time been observed that the muscles in this affection are not susceptible to the interrupted current or faradization—that a painful amount of it may be used, and yet there shall be no response on the part of the muscle. I have had several cases in the hospital which completely establish the fact. On the other hand, if the continuous battery current is used, even in a mild degree, excitation immediately occurs; that is, when the current is completed and again broken.

In the very first case on which I experimented some years ago we found in the case of a young man suffering from lead paralysis, that whereas no irritation of muscle could be displayed by the magneto-electric machine, immediate contraction took place on the application of fifteen cells of the battery—an amount which produced a scarcely perceptible effect on the arm of a healthy student.

It is observed that as the cure progresses so the susceptibility to the continuous current becomes less, and that to faradization greater, until, as in the healthy subject, both forms cause contraction of the muscles. The case of lead is very striking, because there are kinds of paralysis in which the two forms of galvanism act in the opposite manner; thus, lying in a bed near that of our patient, who was the victim of lead poisoning, was a girl suffering from old-standing spinal paraplegia; in her case the continuous current produced not the slightest effect in stimulating the muscles of the leg, whilst faradization produced strong and painful contractions of the muscles. The same occurred in a man who had long been bedridden with an incurable paraplegia. It has been thought that faradization acts directly upon the muscle to stimulate it, whilst the continuous current acts through the nerve. This has by no means been proved, but if it had it might be used as an argument that in lead poisoning it is the muscular rather than the nervous system which is affected by the metal. Such an opinion, however, is not borne out by experience, seeing that the whole cerebro-spinal centres may become atrophied in plumbism, as evidenced by epilepsy, general paralysis, or dementia. The atrophy resulting from lead differs from that which is called idiopathic in this respect, that although in the two cases no difference is observable in the form of wasting, yet in the latter there is very little susceptibility to either form of galvanism. It has been suggested by Dr. Russell Reynolds that there is no essential difference between the primary and the induced current, but that the simple interruption in the one case is sufficient to account for its peculiar effect—that muscles under abnormal conditions may not be able to take cognizance of a simple current passing through them, whereas they would if it were broken. If this were so, the primary battery current, if interrupted, should produce the same effect as the ordinary induced current or faradization. In one or two cases where the experiment was tried, the result did not verify the suggestion. Where, for instance, one pole was placed just below the elbow, and the other pole stroked down the arm, a contraction took place when it was lifted from the limb or again replaced. The current was then interrupted by a wheel, but exactly the same phenomena occurred, contraction on making and breaking contact, but none whatever as the sponge was stroked down the arm. With faradization, on the contrary, violent contraction took place. In this case, therefore, the difference between the two forms, even when both were made to intermit, seemed well marked. Further observations, however, are required before I could give a decision on this matter, either for or against the suggestion of Dr. R. Reynolds.

I have already spoken of the intractability of cases of spasm and contraction of the muscles. In many cases organic disease of the spinal cord and nerves exists, and, therefore, no result could be expected; but even in others, as in wryneck, where an immediate effect of galvanism was witnessed, no permanent good resulted from its use. Even in cases of so-called hysterical contraction of the arm I have been much disappointed at the failure of galvanism.

The effects on the muscles in the cases of spasmodic contraction is seen in the reports, in which it appears that they are more susceptible to faradization than to the continuous current.

One must not forget to mention the soothing effect of galvanism. In cases where neuralgic pains have existed, patients have expressed themselves as much relieved by its application, and have often slept better afterwards.

The public is so much impressed with the value of electric baths that I proposed to try it in a case of lead poisoning. I am aware that others have pronounced it to be valueless, which, in all probability is the case, there being no proof that the galvanic current passes anywhere but over the surface of the body. In my case the speedy success was so remarkable as to throw strong suspicion on its having had any value at all.

I give the case below with the mode of use. Usually, I believe, the plan has been to place the patient on an isolated stool in the water, with one pole in his hand, the other being attached to the bath. In the present case Mr. Sandy used a different method.

Case 1.—*Paralysis of Leg.*—George W., æt. 36, admitted into Stephen Ward June 19th, for weakness of the left leg, and left July 23rd. This man was the subject of a remarkable enlargement of the veins on the surface of the abdomen, indicating some obstruction to the vena cava. He had observed this fourteen years, but it had given him no inconvenience nor interfered with his employment.

Patient stated that in March last he was seized with very acute pains through the left hip and groin, which gradually spread down the leg; and these pains were worse at night. Went to Swansea Hospital, where knee became contracted, and he took to crutches. He was then sent up to Guy's Hospital. He was put to bed, being quite unable to walk, on account of pains and weakness in the left leg. On examination, no local cause was discoverable for the symptoms; the leg was somewhat drawn up, it was perceptibly wasted, being smaller than the other, and sensation slightly impaired. On testing the limb the muscles were found to respond to both the faradic and galvanic currents. He was then ordered the continuous current to be applied daily to front and back of thigh. After the first application he expressed himself as having much relief from the pain, and in a few days it had altogether left him. At the same time the strength returned in the muscles, so that in a few days more he could walk. The current was still applied with a daily improvement in the strength of his leg, so that on July 10th he was walking about, and on the 21st he sufficiently recovered to be able to leave the hospital convalescent and nearly well. Patient took no medicine.

Case 2.—Paralysis agitans.—J. B., æt. 40, had been suffering for three years from paralysis agitans. The complaint commenced in the right hand, afterwards proceeded to the left, and then to the legs, until a general tremor of the whole body took place, including the face, and affecting the speech. He had been under different kinds of treatment, but without any benefit. I wished to try the continuous galvanic current to the spine, and accordingly fifty cells (Cruikshank's) were used for ten days. After the second application the patient, who had previously had very restless nights, obtained refreshing sleep. After four or five applications he began to experience a decided benefit, saying he always felt lighter and steadier directly he had been operated upon. The duration of this improvement lengthened day by day. The patient then left for the country, and has not since been heard of.

Case 3.—Lead paralysis.—Mr. S., a gentleman of middle age, was brought to me, on March 11th, 1872, by Dr. Charlton, of Fareham, suffering from a most severe form of lead paralysis. His whole frame was attenuated in consequence of the atrophy which his muscular system had undergone; his limbs were very much wasted, and he was proportionately enfeebled. He tottered when he walked, his hands shook, and were so weak that he with difficulty could raise them to his head or button his coat. He resembled, indeed, the condition of a man with progressive muscular atrophy, only in this case it was induced by lead and was not idiopathic.

The history which he gave of his case was as follows:—He lived in Surrey, about twenty miles from London, and had enjoyed good health until June, 1871, when his arms and hands became tremulous, so that very shortly he was obliged to use both hands to raise fluids to his mouth to prevent spilling. He was recommended a change of air and took a trip to Scotland; after being there a month he got considerably better and returned home. In a fortnight all the symptoms reappeared more severe than before. He went away again to Southsea, and there used salt-water baths, when he a second time rapidly improved, and at the end of a month returned home. Shortly afterwards, however, the old symptoms reappeared, when he was advised to consult a London physician. He was ordered to use galvanism in the form (he stated) of magneto-electric shocks, which did not benefit him, when his doctor, suspecting lead, had his drinking water analysed and found it to be strongly impregnated by lead. He was then, of course, put on a proper course of medicine, desisted from the use of water, and he improved. He had continued the use of the galvanism. He subsequently left London and again went to Southsea.

When I saw him in March he had got into a stationary condition, and was in the state above described; his limbs wasted and with little power in them. I ordered him some small doses of iodide of potassium and quinine, and wished him to use a simple galvanic current rather than electro-magnetism. Finding there would be a difficulty in making use of this at his own house, I advised him to go to Guy's Hospital every morning, and to this he readily assented.

Mr. Sandy, the electrician, tried the effects of the continuous battery current upon him, and also the induced current, with the following results. In the right arm the extensor muscles contracted well by the application of twenty cells of the Daniell's battery. The induced current was applied, as strong as the patient could bear, with scarcely any contraction. In the left arm the muscles contracted well by fifteen cells, and with precisely the same results on the right arm, with the induced or interrupted current. In the legs twenty cells caused good contraction, but scarcely any result was obtained by the interrupted current.

He continued the use of the galvanism to the limbs daily and made visible progress.

On April 18th he had considerably more power of the limbs than he had a month previously, and, on the muscles being tested, it was found that the 'induced' current, which had been powerless before, now excited the extensor muscles of the right arm, so that the hand was raised on a level with the arm. On application of the same strength to the left arm it extended the fingers much more than the right, but the hand was not lifted to the same extent.

The patient persisted in the treatment up to July, during this period gradually improving, and in August he had quite recovered the use of his hands and was following his usual occupation.

Case 4.—*Lead paralysis.*—Margaret C., æt. 47, admitted February 29th, 1872. She has been married and has a large family. Two years ago her husband died, when she was obliged to work for her living. She gained employment in some lead mills, her business being to grind the white lead. For some months past she has been getting thin and feeble, her arms wasted, together with stiffness and pain in the shoulders. Has had slight colic.

On admission. She seems to be a small spare woman, anæmic and sallow, looking indeed extremely ill. She is thin, owing to a general wasting of the muscles of the whole body, more in the extremities and especially in the arms. She is too feeble to walk, and therefore obliged to keep her bed. She can scarcely raise her arms from her side, owing to the atrophy and weakness of the muscles ; the extensor muscles of forearm are extremely wasted, rendering the arm quite flat, the wrists drop without there being the slightest power to raise them. Muscles of hand soft and flabby, the right arm and hand worse than the left, so that she cannot use them for feeding herself. The blue line on the gums well marked, and a distinct blue stain along the lower lip corresponding to the stained border of the gums. Slight œdema of eyelids. Ordered ten grains of iodide of potassium three times a day. Tested by galvanism. Faradization :—As much power as the patient can bear has a very slight effect upon the extensors of the thumb and not upon the other muscles. Continuous battery current :—Good and well-marked contraction of all the extensors by twenty Daniell's cells. The continuous current ordered. Mr. Sandy finds the more efficient method to be by placing the fingers in water containing a little salt, the negative pole is placed in the water, and the positive pole gently stroked along the extensors. This causes contraction of the muscles and elevation of the wrist ; when the poles are reversed the current and the effect are less.

April 17th. The continuous current has been used to the limb daily up to the present time, and the improvement has been marked though gradual. The blue line on the gums is much less. She is out of bed to-day for the first time. As the improvement has being going on, so the muscles have become susceptible to faradization, whereas they have required a larger amount of simple galvanism to affect them.

May 18th. Improved considerably ; walks about. Is able to feed and dress herself. Can extend the wrist, and the arms are larger in bulk. Blue lines on gums and lips disappearing. On testing with faradization, there is marked contraction in the extensors, the hands being well lifted ; this is more so in the left arm than the right, the right being always weaker and smaller.

In this case it may be remarked that besides a well-marked blue line along the edge of the lower gums there was a dark patch on the mucous membrane of the under lip, corresponding in position to that on the gums, but rather more defined and dotted. A question is always asked in the wards whether this mark on the lip is formed independently, or follows that on the gums from contact? The latter is the probable explanation.

In these cases of dropped wrist the back of the hand is often observed to be rounded, apparently from enlargement of the metacarpal bones, but due in all probability to some thickening of the thecæ.

Case 5.—Plumbism treated with electric bath.—Wm. J., æt. 36, admitted under Dr. Wilks, July 17th, and left July 27th. He began to work at grinding lead nine months ago, and at the end of about five months commenced to feel ill, with loss of appetite, pains in his head and abdomen, and general debility. He continued at his work and daily grew worse, until a week ago, when he was obliged to desist, having pains in his limbs, sweating and inability to stand, and vomiting.

On admission: He was seen to be very pale and very thin, having evidently lost a great deal of flesh. Skin hot, tongue furred, marked blue lines on gums. Constipation. Recti abdominis contracted and painful.

July 20th. Ordered an electric bath. This was made by Mr. Sandy as follows:—the bath being prepared, enough sulphuric acid was put into it to give it a slight acid taste (about ℥ iv), the negative pole of the battery, attached to a large sheet of copper about two and a half feet square, was put upright in the bath and the patient placed in it so as not to touch the copper plate; the hand of the patient was held out of the water and in it he held the positive pole. Fifty and eighty cells were tried, but when the current was applied to the neck instead of the hand the patient could not bear more than fifty cells. On making and breaking contact the patient felt a kind of thud through the whole of the body. A bath lined with glazed tiles was used.

The patient used the bath again on the 24th and a third time on the 25th. He said he felt very cold after it. He always had his bowels relieved immediately after it. On each occasion he felt better, and on the 27th he was so much improved that he went out.—*Guy's Hospital Reports*, vol. xviii., 1873, *p.* 148.

22.—ON THE APPLICATION OF ELECTRICITY.

By the Editor of the Canada Lancet.

In Medical electricity there are two principal methods of applying the current, termed respectively, general and localized electrisation, with either the galvanic or faradic currents.

The object of general electrisation is to bring the whole of the tissues and organs of the body under the influence of the electric current. This is usually done by placing the patient upon a metallic plate to which the negative pole is attached, while the positive pole is applied to the surface of the body. For this purpose the faradic or secondary current is the one usually employed; but the galvanic may sometimes be used with advantage, especially where the patient is not very susceptible to ordinary stimulation. For the application of the faradic current to the general surface, the operator's hand is preferable to the ordinary sponge electrode, especially when operating about sensitive parts, as the head and neck; no artificial electrode equals the human hand in flexibility and adaptation to the inequalities of the surface of the body, and excessively sensitive persons will bear this mode of application who could not tolerate it in any other way. Electricity is not a mere stimulant, the effects of which soon pass away, but it possesses tonic properties of the highest value in the treatment of various disorders.

In the treatment of various nervous and functional diseases in which excessive debility is the principal symptom, the tonic influence of general electrisation is most decidedly manifest. It is exceedingly useful in all cases of exhaustion uncomplicated with organic disease.

Localized electrisation has reference to the application of a current of electricity to special nerves, muscles, and organs of the body, and a variety of electrodes of different shapes and sizes for localized electrisation are adapted to the parts to which it is applied. The limits of the present article will not admit of our entering fully into the details of its application to all the various parts of the body to which it may be applied; but we will indicate a few. In applying it to the head one pole may be placed upon the forehead, and the other over the occiput; or a pole may be placed on either mastoid process or on either temple. Less dizziness is caused when the current passes from the forehead to the occiput than when it passes from side to side. Galvanisation of the sympathetic may be readily effected in the cervical region by applying one of the electrodes over the sixth cervical vertebra, and the other in the auriculo-maxillary fossa. It is, however, impossible to exclusively localise the current in the great sympathetic; the spinal cord is also affected in the above method. The spine may be galvanized by applying one pole a little below the occiput, and the other at the coccyx, or by placing an electrode on either side of the spine, one above the other, about two inches apart. Cutaneous faradisation is accomplished by thoroughly drying the skin and applying the current by means of dry metallic electrodes, or by the hand. This method has been found extremely useful in conditions of profound cutaneous anæsthesia. The electric moxa is produced by applying rapidly to one part a dry and finely pointed electrode. It is frequently employed as a counter-irritant in obstinate cases of neuralgia.—*Canada Lancet.*—*Med. Press and Circular*, *Dec.* 11, 1872, *p.* 514.

23.—ON THE INFLUENCE OF THE CONTINUOUS GALVANIC CURRENT OVER VOLUNTARY MUSCULAR ACTION.

By Dr. G. V. Poore, Assistant Physician to Charing Cross Hospital.

In the number of the Practitioner for September last will be found a paper by the writer on a case of "Writer's Cramp and general Spasm of the Right Arm," which, though of nine years' standing, was successfully treated by the joint use of the continuous galvanic current, and the rhythmical exercise of the affected muscles. For the benefit of those who may not have read that paper, I may be allowed to say that the method of treatment was as follows:—A continuous current was passed through a single muscle (such as the deltoid) or a group of muscles (such as the flexors of the wrist and hand); and while the muscles were under the influence of the current, the patient was ordered to exercise them voluntarily. This method of treatment was followed by the best results—results which were surprising to myself and my medical friends.

At that time I offered no explanation as to why this method of employing galvanism proved so serviceable. I was inclined to regard the galvanism as of use merely in overcoming muscular spasm, and attributed to the rhythmical exercises most of the permanent improvement which took place. Since then I have had further experience of this method of employing galvanism, and have obtained some insight into the *modus operandi* of the continuous current when thus employed.

One of the usually prominent symptoms in writer's cramp or palsy is a feeling (more or less intense and more or less unbearable) of fatigue along the muscles of the arm. This may be limited to the fore-arm, or may extend from the shoulder to the tips of the fingers. I have found that this feeling of fatigue is at once removed by the application of the continuous galvanic current either along the course of the nerves or muscles of the arm. One patient, who has suffered very acutely from this feeling of fatigue, has always expressed great satisfaction during the employment of the current, and has frequently used the words "comfortable" and "pleasant" to express his sensations. He has also often said, "*That seems to give me strength, to give me a sense of power in the arm.*" This patient also had a difficulty in supinating the hand of the right arm. There was no true paralysis, and no visible wasting of any of the muscles (though the whole of the arm and fore-arm was notably flabby, and remarkably non-muscular); but the act of supination was a laboured act, and the patient soon tired of performing it.

On telling him to alternately pronate and supinate the hand, these acts were accomplished tolerably well for the first four times, then the act of supination became slow, and was accomplished with an evident effort, and after four or five more attempts it became impossible; and this, as far as one could see, was not due to any spasm of antagonising muscles. When the supination came to a standstill, I placed the positive sponge-holder of my battery as near as possible over the spot where the musculo-spiral nerve turns forward at the outer part of the elbow-joint, and the negative on the spot where the radial nerve becomes superficial on the radial border of the fore-arm. The number of elements employed was sufficient to cause an appreciable but not painful sensation to the patient. This seemed to help the supinators over their difficulty, and the patient continued to pronate and supinate his hand without the least trouble, telling me at the time that "he could do it much easier when I passed the current," and also "*that it seemed to give him strength.*" Other muscular exercises were practised with this patient, such as repeated flexings and extendings of the fingers or of the thumb alone, and he always said that the movements were accomplished more easily, and he got less readily fatigued when a galvanic current was passed through the muscles implicated, or along the nerve supplying them. "It seems," he said, "to give me strength and power." One is not inclined, at least I am not, to pay much attention to the sensations and expressions of a patient; and although my patient was an intelligent man, I thought nothing of what he said until I found another (also suffering from writer's cramp) who said precisely the same thing, "that he could accomplish repeated muscular acts with far greater ease during the passing of a current, and that after the employment of the current he had a feeling of strength and power in the arm." This latter patient's expression demanded attention, for he was a medical man, and himself accustomed to the employment of electricity. This gentleman suffered acutely from the miserable feeling of fatigue in his arm; and though his muscles are big, and he is decidedly athletic, he soon tires of repeated exercises. This tiring of the muscles and the feeling of fatigue were both obviated by the employment of the current.

From these disjointed observations I got the idea that the passage of the continuous current through muscles, or the nerves supplying them, increases the susceptibility of those muscles to the stimulus of the will, and that their voluntary power is thereby greatly increased.

I proceeded to submit this notion to the test of experiment, and nearly every experiment I have made goes to prove the correctness of my theory.

The first experiment was made upon the patient (H. M.) first mentioned in this paper. I asked him to hold his left arm at right angles to his body, and in the palm of the hand I placed a weight of seventeen ounces. "Now," said I, "tell me when you begin to feel tired, and that you can go on no longer." In about four minutes (the experiment was only tentative and not exact) he complained of great pain in his muscles—deltoid, triceps, biceps, and fore-arm—and declared his inability to go on. I then placed the positive rheophore high up in the axilla, and applied the negative one to the painful parts, when he at once said, "All the fatigue is gone, and I feel as strong as when I began." On the evening of the same day a scientific friend kindly submitted himself to a similar experiment, and the result was the same. When the sponges were applied, he said, "All the fatigue is gone; I feel just as though some one had given my hand a support." I need hardly say that great care was taken not in any way to support the limb with the rheophores; in fact in these experiments one of the rheophores at all events has generally been as an additional burden to the arm. The current employed has hardly ever been strong enough to produce involuntary contraction of the muscles. My next experiment was made on a student of medicine, Mr. L. S. The result was exactly similar. At the end of seventy seconds he began to make complaints of pain and fatigue, which the current at once removed, and he continued to support the weight for five minutes and a quarter, declaring at the end that if I wished he still could go on, which I would not allow. This was the right hand. We then tried the left hand, without employing any current at all. He broke down in considerable pain after holding the weight for two minutes and a quarter. In the evening of the same day he stated that his left hand had been aching all day, but that the right had not given him any trouble. Two days later he tried the right arm again, but without using the current. He managed with the greatest difficulty to support the weight for three minutes and ten seconds, and the effort was followed by considerable aching and pain. On December 6th I asked my patient H. M. to hold the weight in his left hand, and on this occasion no electricity was used. He is a man whose power of endurance is very great, and he managed to sustain the weight for *six minutes*, but endured considerable pain and fatigue while doing so. On December 7th I first galvanised the arm, and then got him to repeat the experiment, and while the experiment was in progress I occasionally passed a current down the arm and through those muscles in which any sense of fatigue or pain was developed. On this occasion he managed to sustain the weight *for thirteen minutes and a half*, a time which I should think few, if any, men could accomplish without aid.

Similar experiments to these have been tried on several of my friends, and they all tend to show that the endurance of voluntary muscular action is enormously increased by the passage of a continuous current, and that the feeling of fatigue, both during and after the prolonged effort, is mitigated or entirely obviated. It may be that the first result is merely a consequence of the second.

Experiments have also been made, and with results which tend to show that the force, as well as the endurance, of voluntary muscular action is increased by employing a galvanic current. The muscles experimented upon have been the flexors of the fingers, the contracting force of the muscles being registered by the squeezing of a spring dynamometer held in the hand.

The majority of my experiments, typical samples of which I have alone given, tend with greater or less force to show that the force and endurance of voluntary muscular action are both increased by the passing of a galvanic current through the nerves or muscles implicated; but as I have above stated, it is exceedingly difficult to get constant results with the spring dynamometer, and although my experiments with this instrument all tend one way, I do not regard the results as final.

The therapeutic importance of this fact is, I think, considerable, and is likely to lead to the combined use of electricity and voluntary movements in many diseases where there is only partial impairment of muscular power. The case which I published in September is only a solitary example of the benefits of this method of treatment, and is consequently of little value. I may mention, however, that I have two similar cases now under my care which are being treated in the same way, and are making rapid progress. It seems to me better in all cases where it is possible to let a muscle react to its proper stimulus the will, than to employ for the purpose of causing muscular contraction a stimulus which is wholly artificial. I should mention that the effect of the galvanic current seems to endure for some time after its discontinuance: how long we cannot say; but my patients, if this is worth anything, tell me that their arms retain the feeling of power and strength for about an hour. I am hoping to be able to make further experiments on the effect of a galvanic current upon common sensation.—*Practitioner*, *Jan.* 7, 1873, *p.* 37.

24.—CASES ILLUSTRATING THE EMPLOYMENT OF CENTRAL GALVANISATION IN VARIOUS SENSORY DISTURBANCES.

By Dr. Thomas Buzzard, Physician to the National Hospital for the Paralysed and Epileptic.

The influence of the constant galvanic current in relieving pain, and often permanently arresting it, in the district of a single nerve or the distribution of a plexus, is by this time well established, although the conditions which affect its success or failure must be allowed to be still undetermined. I have been trying central galvanisation lately in a number of anomalous conditions of the sensory organs, as well as in cases of well-marked neuralgia, with a varying result. Out of these cases I propose to cull a few which appear the most interesting, or about which I am in a position to give the most accurate information.

Case 1.—A man, aged 68, had suffered for one year from pain, limited to the region of the two upper divisions of the fifth nerve, left side. The pain was constant, but terribly increased besides by moving in walking, or even driving, or by a current of air. There was also such intense hyperæsthesia of the skin that he could bear nothing to touch this side of his face, which was consequently left unwashed and very dirty. He could not even bear the bed-clothes upon it.

The constant current from five cells Daniell-Muirhead—the negative pole of the painful region, and the positive to the nape of neck—was applied once during three minutes. He was then from circumstances unable to attend the hospital for three months, when he appeared again, still suffering as described. The current was now applied regularly twice a day in the manner just noted, with a gradual improvement. After six weeks the pain had ceased to be constant, although it still attacked him at intervals, but the hyperæsthesia of the skin was entirely cured. I could touch roughly any part of the affected region.

I would just add here, that although I have not found any marked benefit from galvanism in ordinary toothache, yet for the scarcely less wearisome aching which remains, often for hours, after the extraction of a tooth, the constant current is of extraordinary value. It will generally stop this effectually at once.

Case 2.—A single woman, aged 42, who had been epileptic from 17 to 35 years of age, applied with violent pain in both parietal regions, occasional loss of memory, and fears about retaining her reason. There was a history of struma in early life, and later a good deal of mental trouble. K Br was useful at first, and then failed to relieve her, as did opiates and chloride of ammonium. The pain was intense, coupled with vertigo, tinnitus aurium, flushing of face, besides occasional stammering and subjective sensation of "people talking." She then had the constant current from eight cells Stöhrer through the temples, and also with the positive pole on the neck, the negative on the painful part, two minutes in each direction.

During the application the pain left her. Three times in each week this treatment, without drugs, was continued for six weeks. Sometimes the pain would return as soon as she had quitted the electrical room, at others it would leave her for a few hours. On the whole, however, she improved: her memory was clearer, she lost some of her discomforts, and became more cheerful. But this did not last, and at the end of this time it was pretty evident that she was in very much the same state as at first. I therefore stopped the galvanism and gave her arsenic, which immediately relieved her much more than anything which had been done.

These were cases of neuralgia.

Case 7.—A single woman, aged 29, had suffered at the time of her application at the hospital, for two and a half years, from severe pain in the head, as often on one side as on the other. Her appearance was striking from the hair of her head being throughout completely grey, the change in colour having commenced when she was seventeen years of age. She had, as might have been expected, a neurotic family history, which is worth giving in detail. One of her sisters, it seems, turned grey at twenty-one, and died at forty-seven of "epilepsy." Another sister died between thirty and forty years of age of consumption, and "*her* mouth," the patient said, "was drawn to one side." A third sister is still living, thirty-four years of age, and not at all grey. Six of her brothers died in childhood—one suddenly at seven years of age, one soon after birth, and the others either of zymotic diseases or from some cause which she could not remember. Her mother, still living, seventy-six years of age, suffered during the last two winters from neuralgia. Her father died of dropsy, after rheumatic gout and drinking.

She herself was in good health till four or five years ago, when she became subject to violent headache, which for the last two and a half years had never entirely left her.

The occipito-parietal region of the head was indicated as the chief seat of the pain, which attacked sometimes one side and sometimes the other, and the corresponding arm was described as feeling numb and wanting power during the exacerbations. Digital pressure upon the occipital bone and in the neighbourhood of each parietal eminence made her flinch very much. There was nothing in her other organs to call for remark.

Chloride of ammonium, iron, and quinine were severally administered without good result, but were often vomited. Chloroform and belladonna were also applied locally without relief. For three weeks she was injected subcutaneously with morphia (⅛ grain), and with considerable temporary relief, the effect lasting more or less for twenty-four hours. The injection made her quite stupid for several hours, and she slept well during the night following, her ordinary habit being to be woke up repeatedly by the pain. Altogether, she said, she had never been so easy as under this treatment.

The constant current, derived from twenty to twenty-five cells of Daniell-Muirhead battery, was then employed, the positive rheophore being applied to the nape of the neck, and the negative to the tender points in turn, the application to each lasting two minutes. Then a rheophore being placed on each temple, a current of like strength was passed for two minutes. This treatment was continued three times a week for three weeks. The patient reported that during the application of the current she entirely ceased to feel the pain, and that generally for two or three hours afterwards there was considerable ease. The alleviation, however, did not last nearly so long as that produced by the morphia injection. A trial was then made of a proceeding which is termed galvanization of the sympathetic. One of the rheophores (a small metallic disk covered with wetted leather) was held firmly in the right auriculo-maxillary fossa, and the other applied to the side of the lower cervical vertebræ, and a current from fifteen cells of Daniell-Muirhead battery allowed to pass during five minutes. This treatment has now been continued for ten weeks, the current being thus applied from three to six times a week. She says that during its application she feels very bad, and as if she were going to die, the sensation being very much worse than that produced by the other electrical treatment. The giddiness persists for half an hour, but there is no faintness. The resulting ease, however, lasts far longer than that which followed the former process, often continuing until the next day. At times she has been a good deal better, and altogether it is certain that she has not had such violent attacks as formerly. On the other hand, she cannot think the relief is permanent, for if she goes a little longer than usual without the treatment, the pain becomes severe. I have now ordered the application to be used to each side of the neck in turn at every sitting.

The process of galvanization just described, it is right to mention, is sometimes attended with more unpleasant results than those which this woman described. Some years ago I was attending a gentleman, aged forty-six, who suffered from epileptoid attacks and a variety of nervous sensations. On one occasion I applied this process to him, employing, however, a much more feeble current—that derived from five cells of Foveaux's battery. I noted before commencing that his pulse numbered 78, and was steady and good. He described himself as feeling better than usual. The application had only been continued during two minutes, when he changed countenance, complained of feeling faint, of a tightness about the brain, difficulty of breathing, and feeling of sickness. There was an imitation in fact of the feeling which preceded his attacks. I observed that his pulse had lost force and beat more slowly, that his face was pale, and his pupils widely dilated. With the aid of a stimulant he gradually revived sufficiently to leave my house. He did not come again.

I think it is difficult to feel convinced as yet that the process described is really a galvanization of the sympathetic. It must be remembered that the rheophore, when planted in the auriculo-maxillary fossa, is in the immediate neighbourhood of several important nerves, and indeed is nearer to them than to the superior cervical ganglion. That there is always a considerable diffusion of electricity from the spot to which a rheophore is applied, there can be no doubt. I have frequently observed, for example, that in attempting to galvanize the anterior tibial muscles of the leg in a case of infantile paralysis, the current has been conveyed to the muscles of the calf or the outside of the leg, and caused them to contract. It is impossible to conceive, therefore, that the numerous nerves which are to be found just below and about the temporo-maxillary articulation can escape at least some of the influence of the current when applied to this region. The important experiments of Brown-Séquard have shown us that galvanization of the sympathetic in the neck causes contraction in the walls of the arteries supplied by its branches. Now, branches from the superior cervical ganglion proceed to the internal carotid, forming the carotid and cavernous plexuses and following the vessels as they branch to their distribution. One of these ultimate branches, the central artery of the retina, is, thanks to the ophthalmoscope, within our ken. If the process described be a true galvanization of the sympathetic, we might expect to see, during its application, some alteration in the size or colour of this branch. On one occasion I got Dr. Tibbits, our electrician, to apply the process to the woman whose case I have above related, whilst I carefully watched the fundus oculi of the same side with the ophthalmoscope, employing the direct image as being the largest and in all respects the most favourable for this observation. The woman had a large pupil, and the view obtained was exceedingly distinct. There was certainly no change whatever to be observed in the size or colour of the artery during the passage of the current, nor after its withdrawal. In the case last described it therefore seems at least as likely, I think, that the unpleasant effects upon the patient were produced by accidental galvanization of the pneumogastric as that the sympathetic ganglion was acted upon. It will be remembered that in 1846 it was shown by the brothers Weber that galvanization of the pneumogastrics in the neck caused the pulsations of the heart to become slower, and, if applied in sufficient strength, arrested its action altogether. So, again, it is conceivable that in the woman's case the relief she experiences may be owing to galvanization of the auriculo-temporal nerve, and possibly a thence reflected influence upon other branches of the fifth, for the rheophore is at least as near to this trunk as to the superior cervical ganglion.—*Practitioner*, *Feb.*, 1873, *p.* 81.

DISEASES OF THE ORGANS OF RESPIRATION.

25.—ON THE USE OF ERGOT IN THE HÆMOPTYSIS OF PHTHISIS.

By Dr. F. E. Anstie.

[The following all belong to a natural group of consumptive cases in which considerable hemorrhage precedes the development of any distinct physical signs. These patients are for the most part in comparatively good general health at the time of the first occurrence of the hemorrhage, and they usually possess an active circulation and a somewhat florid complexion.]

The first example was a typical case in a young man aged twenty-one, of tall and slight frame, and of decided consumptive family history; he had been working as a gas stoker, and although that occupation might be supposed to be very taxing to his constitution, he had followed it for a considerable period without feeling ill effects, and indeed was not aware of having ever suffered from illness. The first hemorrhage happened without warning: he had just come off night duty and was feeling very tired, when he suddenly felt faintish and had a salt taste in his mouth; a hacking cough came on, and then a gush of pure and somewhat bright-coloured blood came from his mouth, to the extent, as he declared, of nearly a table-spoonful. He lay down for some hours, during which the bleeding did not recur; and towards one o'clock p.m. came to the Westminster Hospital to present himself as an out-patient. In the passage to the waiting-room he was again attacked with coughing and bleeding, and I saw about four ounces of blood in a gallipot which the porter had lent him. When he appeared in my room he was feeling somewhat faint and ill, with flushed cheeks and a very rapid small pulse. I advised him to come into the hospital, but he refused. I therefore examined and prescribed for him as an out-patient. On stripping him we found the chest apparently well formed and with good expansion; there was nothing abnormal in the breathing, except some jerkiness of inspiration over the upper half of the right lung, and a certain amount of indistinct small bubbling in patches over the same lung. He was ordered to take gallic acid in ten grain doses every four hours, and to remain on his bed quite motionless until the next out-patient day, with the usual precautions as to diet. In four days he came again to the hospital, and related that he had had no large return of hemorrhage, but that several times in each day he coughed up quantities of blood varying from a mere spot to a teaspoonful or more of pure blood. The treatment was continued for three days longer, with the addition of ice, which he frequently sucked in small pieces. On his next visit he reported that the hemorrhage had ceased for the last forty-eight hours; the same treatment was ordered for the next four days. On the next hospital day he reported that the bleeding had returned some hours previously; he looked exceedingly ill, and several times coughed while in my presence, bringing up small quantities of nearly pure blood. I now examined his chest again, and it was pretty obvious there was a considerable amount of blood retained in the tubes, and in fact I afterwards heard that next morning he brought up a considerable quantity, of very dark colour, feeling much relief to the breathing afterwards. The gallic acid was continued. Four days afterwards he reported that the hemorrhage was still very troublesome, though never coming in large quantities; he looked haggard, but still had a red flush on each cheek; I again carefully examined his chest, but could detect no further development of physical signs. I now determined to try ergot, and accordingly prescribed forty-minim doses of the liquid extract every four hours. This treatment was followed during eight days, when the patient left it off of his own accord because he had had no recurrence of the hemorrhage since taking the third dose of the ergot. Two days later he saw me again, and reported this result, remarking that he felt quite well, nor could I persuade him then to undergo any further treatment. This occurred six months ago. I have seen him once since then, when he brought a brother to the hospital; I persuaded him to let me listen to his chest, and detected unequivocal prolonged expiration and dulness on percussion at the right apex, but I could not convince the man that he was at all ill and have not seen him since.

Another case was that of a boy of fourteen, remarkably tall and slender, who came as an out-patient with a history of blood-spitting for the last three days, apparently the result of a strain in fast running. It may be doubted if this case could confidently be called phthisical, but the boy's father was certainly consumptive. On inspection there were no physical signs whatever suggesting phthisis, but the boy was suffering from night sweats and had lost much of his muscular power within the last few months. The hemorrhage consisted of patches of blood mixed with mucus and fine froth, which were spat up after coughing, five or six times a day. The boy was of a florid complexion, very thin, and with a pulse of 100. Examination of the chest revealed absolutely nothing abnormal. Gallic acid was ordered in five-grain doses every three hours, with the usual diet and precautions. At the next visit, three days later, the hemorrhage was reported decidedly worse; and whilst in the room the boy several times coughed violently—only once, however, bringing up blood, but then to the extent of nearly a teaspoonful. He was ordered ergot in thirty-minim doses every four hours; and at the next visit, four days afterwards, reported himself quite free for the last two days from blood-spitting. He was put on cod-liver oil, and remained under observation until two months from his first visit, at the end of which time he was examined, and except a very slight dulness on percussion, and prolonged expiration at left apex in front, nothing wrong was detected.

The fifth case was that of a sempstress, aged nineteen, who came to the hospital complaining of acute pain under the left clavicle, cough, and blood-spitting, which had attacked her two days previously. She had always been rather weakly, but had had no important illnesses until she got typhoid fever, about a year before her coming to me. Ever since that she had been ailing, with a sense of general feebleness, but there had been neither cough nor expectoration till about a month before her coming to the hospital, when she got wet through and chilled: this seems to have produced severe bronchial catarrh, but she had hoped she was shaking the latter off. When examined she showed but little excitement of pulse or breathing, but had a hacking cough, and told me that she was spitting blood, in streaks, with almost every cough. Percussion revealed nothing abnormal; auscultation only detected some rather coarse râles posteriorly, on both sides. Ergot, in 40-minim doses of the ext. liq., was ordered every four hours: both cough and hemorrhage diminished after the first dose or two, and disappeared in less than thirty-six hours. The hemorrhage did not recur at all for nearly five months; she then applied for relief, saying that the hacking cough and blood-spitting had again returned, rather worse than before. There were still no physical signs of any permanent mischief in the chest; but the patient had wasted considerably, and complained of night-sweats and almost total loss of appetite. It was now determined to try acetate of lead, which was given in two-grain doses every four hours, the usual precautions as to rest and diet being enforced. This treatment was continued during three weeks, in which time the patient had in many respects singularly improved (*e.g.* in flesh and strength), but the cough and the blood-spitting remained almost as bad as before. The ergot was now prescribed in the same doses as at first: the effect on the bleeding was striking and immediate; after a very few doses it entirely ceased.

The sixth case was that of a married lady (suckling her second child), who was of very fragile and delicate appearance. Two years before she had been recommended to marry (and did marry rather suddenly) in the hope of arresting consumption, the danger of which had been intimated by an acute attack of hæmoptysis. She had not, so far, had any recurrence of the bleeding, and had kept pretty good health on the whole till the present lactation, which had tried her exceedingly. At the time of her first visit to me she had begun to sweat most copiously, not only at night, but also at least once in the daytime; and the blood-spitting had returned. Pulse 98; resp. 28. Nevertheless, there were but trifling physical signs: scarcely more than a doubtful prolongation of expiration in the left supra-spinous fossa. The hæmoptysis was in bright red streaks after almost every attack of coughing, which was frequent. It was determined to treat her without any change in her circumstances except the administration of ergot in the usual doses; and this proved perfectly successful; the bleeding ceased almost immediately.

The seventh was that of an old woman of sixty-one, with bright black eyes, parchment skin, and a lively, nervous manner. She said that she had seldom ailed at all, and accounted for the bleeding by her having strained herself in some household work: hæmoptysis came on in a sudden gush, after a not very severe fit of coughing. Examination of the chest showed traces, not very marked, of chronic bronchitis and emphysema; there was no detectable fever. The hemorrhage stopped after a very few ten-grain doses of gallic acid. This woman's case developed into confirmed and rather rapid phthisis.

[In some cases hemorrhage into the lungs is not so much an effect of, as a cause of phthisis. Blood retained in the air-cells is a direct irritant to the pulmonary tissues. It results from this that hæmoptysis should always be checked as soon as possible. There are rare cases in which this rule does not obtain, viz., where, along with a tendency to occasional extensions of consolidations already existing, there is an absence of softening and a clear history of relief to respiration and improvement in general health after a previous hemorrhage or hemorrhages. In none of the three following cases, however, would a passive attitude have been justifiable.]

Case 1.—Was that of a tinman, aged 37, a very intemperate man. He was in the habit of drinking half to three-quarters of a pint of gin daily, besides a variable amount of beer. The hæmoptysis had come upon him suddenly; a large gush of bright blood followed a coughing fit the day previous to my first visit, and recurred in the evening in the same sort of way. He was a middle-sized but powerful-looking man, though with the marks of drinking plainly set upon his face. He said that he was rather liable to colds, attended with violent spasmodic coughing, and that he had had such a cough for the last week or two. He also told me that he had several times suffered from attacks of very sharp stitch-like pain in the left side which would last perhaps for two or three days, on and off; and that he felt "feverish" and bad at such times. On examining his chest it was evident that this man offered a good example of the commonest form of alcoholic phthisis, and that this affection had lasted some time. The left chest was markedly contracted; the infra-clavicular region was much sunken, and there was a considerable depression at the site of the old stitch-like pains; over the larger half of this side anteriorly, and to a less extent posteriorly, inspiration was harsh and jerking, expiration decidedly prolonged. Percussion over the same regions elicited a dull sound in patches; and, indeed, nearly the whole left chest was less resonant than the right. The patient was stringently ordered to abstain completely from alcoholic drinks, and to remain quiescent in the horizontal position; 2 grains of acetate of lead in pill, with ¼ grain of opium, and two drachms of infusion of digitalis in mixture, were to be taken every six hours. There was no recurrence of the hemorrhage during the next three days, but it then returned, in rather large amount, twice within twenty-four hours. On the second visit the man looked much worse; the complexion was of a streaky red and yellow; the pulse 98; and the temperature (2 p.m.) was 101°·2: he complained of continuous and severe pain at the old place in the left side. Forty minims of liquid ext. ergotæ were ordered every few hours, and the effect was decided: the excited pulse subsided, the pain in the chest abated, and there was only one slight recurrence of the bleeding during the next week. On his appearance at the end of that time at the hospital, the patient looked greatly better: he continued to take the ergot during three weeks. Examined at the end of that time, he was found to present just the same physical signs as at first; but his general health had greatly improved, the cough had ceased, and he was not conscious of any pain or inconvenience in the chest.

Case 2.—Was that of a blacksmith, aged 24, intemperate, who had been working with increasing difficulty at his trade, owing to a feeling of dyspnœa which had troubled him for about ten months. His father had died of consumption at the age of 36; he had himself suffered from cough and a sense of oppression at the chest, which had never left him after a severe cold, with bronchitic expectoration, which attacked him in the beginning of the winter 1870–1, and was rather worse than usual when he first came to me in March 1872. At this time there was a considerable amount of catarrhal bronchitis: rhonchus and sibilus, mingled here and there with coarse moist râles, were scattered over a large part of both lungs; there was also slight fever and somewhat quickened pulse. The patient was treated with liq. ammon. acet. ʒ iij. and decoct. senegæ ℥ j. ter die, and desired to remain indoors. At his next visit, four days later, the bronchitic sounds had nearly vanished; the sputa were less frothy and profuse, but there were pain and burning soreness under the sternum and in the right infra-clavicular and mammary regions; the temperature was found to be 100°·4 (at 1.30 p.m.). A more careful examination of the chest now showed that there was less complete expansion of the upper portion of the right chest than of the left; and about two and a half inches below the right clavicle there commenced a patch of rather marked dulness, which occupied an irregularly shaped space, the total area of which may have been equal to that of a crown-piece. Breathing was harsh (indeed semi-tubular) at this place, and expiration much prolonged. At the posterior aspect of the same lung the same percussion and auscultation sounds were heard over a rather smaller space and a little lower down. Four days later the patient again presented himself. It appeared that, on the evening before, he had been seized, rather suddenly, with pain under the left mamma, and short breath: an hour and a half later he coughed a good deal, and then his mouth was filled with very bright red blood; this happened three times more in the course of the night. About 4 a.m. he fell into a heavy sleep that lasted till 7.30, when he awoke bathed in perspiration, and coughed up about a tablespoonful of rather darker blood than that which had come at first. When he came to the hospital he was pale (but for a small red spot in each cheek), trembling, and very anxious-looking; pulse 108 and very weak. He said that on his way to the hospital he had to sit down several times on doorsteps, and that he had been coughing small quantities of blood all the morning. The chest was carefully examined, and the left lung was found to be entirely free from signs of disease; its sounds were puerile, as might be expected from the state of the other lung. In the latter, the old harsh sounds were only very imperfectly heard, being much mixed with and confused by rather large bubbling râles. The coughing up of blood, though in small quantities, was so persistent that—taking his history into consideration—I was much inclined to believe that an aneurismal dilatation of one of the pulmonary vessels had given way. As he had been taking the acetate of lead and sucking pieces of ice up to the last moment with apparently no effect whatever, I now ordered 40 min. of the liquid ext. ergotæ every four hours, and particularly desired that when the cough came on he should be raised (not lift himself) and assisted to lean forwards, so that, as far as might be, the bloody sputa might be expectorated rather than retained on the lung. When I saw him three days later, his appearance was remarkably improved, though he still looked pale and weak. There had been no hemorrhage worth mentioning after the fourth dose of the ergot, and from the first it seemed to decidedly check the bleeding. He continued taking the ergot steadily for a week, at the end of which time he was probably in the same state as before the illness; that is to say, his right lung remained in a state of what might be called chronic "fibroid phthisis," with scarcely any active processes going on. For some three or four months I kept this man in view, and the hemorrhage did not recur. He took some cod-liver oil, and was fairly abstinent from drink as long as I saw him. He disappeared from my observation about nine months ago, and has not applied to me again.

Case 3, is that of a single woman, aged 40, a machine-sempstress. She applied to me in great alarm on account of a series of bursts of hemorrhage, preceded by only moderately severe cough, which had come upon her during the last four days: on some nine or ten occasions she had brought up quantities varying from a mere spot to a tablespoonful or more. Finding that her menstrual flow had been somewhat rapidly diminishing, I hoped that the incident was only temporary and unimportant: but on examining her chest I found scattered patches of decided consolidation in both lungs. Alum was prescribed in 10-grain powders every four hours, and continued for a week but with no success: the ergot, in the usual doses, was then ordered, and the hemorrhage diminished at once, and disappeared in the course of three or four days. I think it probable that the severity and obstinacy of the hemorrhage were in some measure influenced by a disturbed state of circulation due to a rather brusque process of uterine involution; but it should be mentioned that the period of pulmonary hemorrhage did not correspond with the usual dates of this patient's menstruation.

The last part of this inquiry concerns the administration of ergot in cases of advanced phthisis where a rapidly advancing destructive process cuts into vessels of considerable size which had remained fully pervious. The emergency may be extreme and most alarming; the hemorrhage being considerable in quantity, and liable to recur constantly: moreover, the irritative effect of the effused blood in the air-cells is apt to be extremely severe; in fact, may produce pneumonia which kills the patient in a very few days.

1. The first case of this advanced kind in which I employed ergot was indecisive, though encouraging, as to the results. The patient was a personal friend, whose illness I had watched during more than three years. Hemorrhage had been by no means a conspicuous feature of his case: it had occurred only occasionally and to an unimportant extent in the earlier stages. The disease was chiefly, if not altogether, in the right lung. He had been going steadily down-hill for about six months, with continuous evidences of softening, till, in the last week of 1871, he was attacked with violent and repeated hemorrhages of florid blood. His usual remedy, glycerine of gallic acid, seemed to have comparatively little influence on the bleeding, and I accordingly employed ergot. I scarcely remember why it was that in this case I used the tincture, instead of the liquid extract which I generally used, and which I believe on the whole to be considerably more efficacious. However, I had no doubt at the time that the medicine exercised a really controlling influence over the bleeding, which immediately diminished very much. Unfortunately the mischief was done: the effused blood excited intense pneumonia, which carried the patient off a week later.

2. In a case which occurred very soon after this, I was called to a gentleman, aged 47, who had suddenly lost a "pint" of bright red blood. This was his first hemorrhage. It appeared that he had suffered undoubtedly consumptive disease (consolidation of both apices), for seven or eight years; but no softening had occurred until a month previously to the bleeding, when he had taken a violent cold, which at once lighted up active mischief. Already there was a cavern of considerable extent in the right upper lobe, and patches of subcre-

pitation in various parts. Before the hour appointed for the visit arrived, the hemorrhage recurred to the extent of a teacupful, and the patient went on spitting some bright blood after every cough. Here the liquid extract of ergot was at once employed in 40-minim doses: the hemorrhage was markedly influenced by the first dose, and stopped entirely after the second. So far as I am aware, this patient (who died about three months later) never had any recurrence of the bleeding.

3. A case occurred in the out-patient practice. The patient was a woman, aged 60, much emaciated, who had been a sufferer from what she called "asthma" for more than twenty years. The story appeared to be that of chronic bronchitis passing at last into phthisis. There were extensive consolidation in the left lung, and patches of dulness in the right; moreover, there was a well-marked cavern in the left upper lobe. Hemorrhage had never occurred till a week previously, but had recurred several times since then. Forty-minim doses of the liquid extract were given, and the hemorrhage quickly stopped.

4. Against these favourable examples of the action of ergot in hemorrhage of advanced phthisis, I must set the case of a patient who was recently under my charge in Westminster Hospital (Burdett Ward). Here the hemorrhage was continuous and large in amount (taken altogether), and after various other remedies had been tried in vain, a fair and persevering trial was given to ergot; but the hemorrhage was not in the least affected. Acetate of lead finally stopped it.—*Practitioner*, *Feb. and April*, 1873, *p.* 65, 224.

26.—ERGOTINE, ITS USE SUBCUTANEOUSLY IN HEMORRHAGE.

DR. DRASCHE believes that ergotine must be regarded as the best of all hæmostatic agents for hypodermic use. On two persons, in robust health, the injection of from ½ gr. to 2 grs. was uniformly followed by a diminution in the pulse of from 4 to 6 beats, and the sphygmograph showed a simultaneous contraction of the calibre of the vessels. The temperature was slightly raised, respiration normal, no influence upon the urine, and the health was quite undisturbed. Some local irritation was caused, but usually passed away soon. Dr. Drasche has employed this method chiefly in tubercular hæmoptysis in doses of ½ to 1½ grs., and in most of the cases the efficacy of the ergotine was very prompt, when other hæmostatics had previously been tried without success; in others, although less speedy, it was still successful, and in one case only out of nine did it fail. In two cases of epistaxis the effect was very speedy, and the dose required very small. It has also been used with marked advantage in hæmatemesis, intestinal hemorrhage, and hemorrhagic scorbutus. The best vehicle is glycerine, containing 5 grs. in ℥ i., and the injection is best made in the region of the pectoral muscles. When the injections have been long continued, or have been too strong, tingling of the finger-ends and cramps of the hands have been sometimes complained of.—*Wien. Med. Wochenschr.*, *Med. Times and Gazette*, *Nov.* 16, 1872.

27.—ON INFLAMMATION OF THE LUNG AS A CAUSE OF CONSUMPTION.

By Dr. ARTHUR ERNEST SANSOM, Physician to the Royal Hospital for Diseases of the Chest, City-road, and to the North-Eastern Hospital for Children.

Condensation and Destruction of Portions of the Base of the Lung in persons manifesting no signs of tendency to Tuberculosis—Consecutive Phthisis.

Case 1.—*Cavity in the Base of the Left Lung—Hæmoptysis—Purulent Sputa—Subsequent Condensation of Right Apex.*—John R., aged 20, grocer, of muscular appearance, applied at the Royal Hospital for Diseases of the Chest, September 30, 1870. He complained of cough, especially at night and early in the morning, with expectoration of thick phlegm occasionally mixed with blood. Had been ailing for seven years, and frequently had cough; began to spit blood four years ago, sometimes as much as two fluid ounces at a time. No night sweats; no loss of flesh; he had gained three pounds in three years. There was practically no family predisposition to phthisis; the only instance was his father's father, who died of consumption (?) at the age of 56.

Physical Signs. There were no abnormal signs whatever, except over a limited space in the base of the left lung near the scapular angle. Here breathing was tubular, and at one spot there were undoubted gurgling râles.

Treatment. Quinine and cod-liver oil, with sedatives for cough. Patient improved in general health; sputa were at first pinkish and muco-purulent.

On October 12 expectoration at one time of two fluid ounces of pus took place.

On the 29th hæmoptysis returned, but ceased after the administration of ergot.

On January 20, 1870, sputa were slightly blood-stained. The physical signs remained as before over a space of two inches in diameter; gurgling very manifest. He had gained weight from 8 st. 4 lbs. to 8 st. 13 lbs., and on March 3 to 9 st. 1 lb.

In March there was increased cough, and loss of weight to 8 st. 10 lbs.; but in April he improved considerably.

I did not see him again until January 10, 1872, when he told me that he had remained in fair health, but always with some cough, till the end of July or the beginning of August, 1871; he then wasted considerably; in November slight hæmoptysis had returned. On examining the chest I found over the spot of old mischief the croaking sounds of a small cavity surrounded by large râles, and around this finer râles. The right apex as far as the second rib was dull, and over it was heard diffuse tubular respiration and the voice-sounds exalted.

Case 2.—Pneumonia of Base of Left Lung with Emphysema—Cavity—Progressive Phthisis.—John H., aged 35, smith, applied at the Royal Chest Hospital, February 3, 1871, suffering from headache, short breath, and cough, with opaque yellow sputa. He suffered cough in infancy, but had no other ailment till a month ago, when an acute cold came on, and he was confined to his bed for a week. His mother was asthmatic, but there had been no consumption in his family.

Physical Signs. Right lung, front and back, exalted resonance. Left base: front dull; very abundant liquid râles, fine and coarse; back, bronchial breathing with abundant râles. Ordered blisters over left base, front and back; effervescing ammonia mixture. After fourteen days' treatment cod-liver oil ℥ ss., bis die. Continued with very slight improvement, and on March 4 admitted as in-patient. Cough was now very distressing; sputa muco-purulent and blood-stained.

March 10. Physical signs: Dulness confined to axillary and infra-spinous regions (base); over axillary region, friction; close to angle of scapula a path of coarse, very liquid râles, approaching gurgling; breathing bronchial in patches, with loose râles. Ordered carbolic acid inhalations; quinine and ether; counter-irritation by pigmentum iodinii.

20th. Discharged from hospital at his own request, to continue as out-patient; he had gained eight pounds whilst under treatment.

On 24th gurgling was very manifest, and there was a "splash" with each impulse of the heart heard over the cavity. The signs continued without change until April 27, when he ceased attending.

Case 3.—Condensation of Base of Left Lung in subject of Chronic Bronchitis—Hæmoptysis—Improvement—Return of Symptoms with Condensation of the Upper Lobe of the Right Lung.—S. B., aged 36, porter, applied at the Royal Chest Hospital, July 15, 1870; complained of pain in back and in abdomen, giddiness, and cough. He had been subject to "asthma" since boyhood. He was seized a week previously to application with rigors and vomiting; hæmoptysis followed. He says he expectorated half a pint of blood. There was no obvious predisposition to phthisis.

Physical Signs. Rhonchi generally over all the chest; at the back over the base of the left lung abundant moist râles, some very fine.

Treatment. Blister over left base; effervescing mixture with iodide of potassium; after fourteen days quinine with ether. Considerable improvement followed, but râles were heard in patches over the affected base. He gained weight, from 7 st. 7 lbs. to 8 st. 8 lbs. He continued treatment till December 9, and then stopped away for a fortnight. On reapplying there were general rhonchi, but no notable signs about the formerly affected base, but deficient resonance with moist râles over the upper lobe of the right lung.

Neither the signs manifested by these patients nor the details of their histories resemble the signs and course of tubercular phthisis; nevertheless, we observe progressive invasion of lung tissue with induced conditions which are clinically indistinguishable from the results of tubercle. The first case points the importance of carefully examining the base of the lungs in those manifesting signs of pulmonary disorganization. I am quite sure I might easily have overlooked the small cavity which was nevertheless manifested by undoubted signs. We are accustomed to think that the initial lesions in ordinary cases of phthisis are, in the great majority of cases, situated in the apices or upper lobes of the lung. Is it not legitimate to hesitate before accepting this doctrine, and to consider whether, in many cases, there has not been broncho-pneumonia of the base, occurring at a period anterior to our examination, the signs of which have disappeared? In these cases there was undoubted broncho-pneumonia of patches of the lung, with more or less disorganization up to the production of cavities. Consecutive to this was condensation of other portions of the same or the opposite lung. What was the relation of these secondary consolidations to the primary lesions? Let us briefly consider the course of pathological changes in a broncho-pneumonia which induces disorganization of tissue. The accumulated exudation cells resulting from the inflammation produce pressure; such pressure exerted on the capillary vessels may cause degeneration and destruction of these vessels, and consequent hæmoptysis; or, further encroaching on the surrounding tissue, the pressure causes "the walls of the alveoli, deprived of nutritive fluid, to degenerate and die" (Niemeyer). What is the consequence of such breaking down of tissue in ever so small a portion of the lung? The conditions are dying and dead organic matter in constant relation, according to the physiological necessities of the lung, with air. The result must inevitably be putrefaction. We have, then, existing within the lung itself a manufactory of septic poison. The experiments of Villemin, Andrew Clark, Burdon-Sanderson, Wilson Fox, Cohnheim, Fränkel, and many others, have proved that in animals the inoculation of putrescible matter is followed by lesions indistinguishable from tubercle of the lungs. "Those materials," says Dr. C. J. B. Williams, "are most sure to produce tubercle, which either resemble it in its tendency to decay, or show a septic character, as foul pus, putrid muscle, carious bone, and the like." The probabilities of septic matters causing tubercle in the human subject were dwelt on by Dr. Andrew Clark in a paper read before the Medical Society of London, and published in the *Medical Times and Gazette* of May 23, 1868. What I wish to point out is, that in any case of local inflammatory mischief of the lung which has been of sufficient intensity at any point to cause a breaking down of the tissue of the lung, a manufactory of septic poison is instituted, which analogy and experience tell us is capable of transmission by the lymphatics of the pulmonary structure, with the effect of producing actual tubercles in the lungs. And I contend that there is sufficient evidence to show that this is a cause, and probably a frequent cause, of the disease which we know as pulmonary consumption.

I think most observers will agree that when once a cavity has formed in even a limited portion of lung the danger of implication of other portions is far greater than it was before. Yet it may be objected that all cavities in the lung do not lead on to pulmonary tubercle—witness pneumonic abscess. It must be recollected, however, that the view I have just propounded requires the concurrence of two conditions for the dissemination of tubercle. First, the breaking down of tissue, and communication with air sufficient to induce decomposition; secondly, the taking up of septic material, thus produced, by the absorbents. So, if the cavity in the lung tissue be lined by a false membrane, or if the tissue surrounding it be so indurated as to obstruct the lymphatics in their work of absorption, the septic poisoning will not take place, and the excavation be noxious only *per se*, and not as a centre for the dissemination of tubercles.

Many physicians must, like myself, have met with many cases of chronic bronchitis passing into phthisis. Patients past middle age, who have suffered from ordinary winter cough for many years, in whom no tendency to tubercle during the ordinary course of their bronchitis was ever suspected, get an attack of more than ordinary severity; after this there is a change from their former symptoms, their pulmonary distress is no longer intermittent, but constant—they waste, they manifest hectic fever, and finally assume all the characteristics of ordinary pulmonary phthisis. Observation of these cases shows that the first sign differentiating from ordinary chronic bronchitis is localization in certain parts of the lung of patches of moist râles, both fine and coarse; diffuse tubular breathing is sometimes heard over them, but is often masked by the other bronchitic sounds; and dulness is sometimes, but not always, detected, because frequently the surrounding lung is superresonant from emphysema. The material point is that there are patches of lung where these moist sounds constantly are heard. These are patches of broncho-pneumonia; if they can be watched they will be found to manifest coarser and coarser râles, until there are undoubted signs of cavity. Gradually the lungs become more and more extensively involved, and the signs, as well as the symptoms, are not to be distinguished from those of the third stage of phthisis.

I think that the extant evidence is sufficient to show that under the term pulmonary phthisis, as ordinarily used, are grouped many varieties of destructive disease of the lungs. It must be the labor of clinical observers to carefully differentiate these varieties. The large number of practitioners who have hitherto been accustomed to consider all cases of phthisis as cases of tuberculosis, will, I feel convinced, be induced, on reconsidering the question, to modify their views. Clinical and pathological research has much yet to do for the elucidation of the subject; but it appears to me that our present knowledge tends to the following points:—That local inflammations of the structure of the lungs, due to various initial causes, are capable of inducing all the symptoms and conditions of pulmonary phthisis; that consolidations of portions of the lungs, the result of such inflammations, are capable of resolution and absorption with restoration to normal health in many cases, even in those manifesting an apparently strong predisposition to phthisis; that there is no special diathesis which is associated with the production of a morbid poison called tubercle; that tubercles are portions of the tissues and exudations of the body in a state of degeneration; that they occur chiefly in weakly subjects, because such persons are predisposed to the low forms of inflammation that induce them, and have less chances of such inflammation ending in absorption and recovery; that the dissemination of tubercles throughout the lungs is effected by the lymphatics, which are well known to be influenced by septic matter; that in many cases of pulmonary phthisis it is very probable that a local inflammation has led to destruction of tissue, formation of cavity, decomposition of organic *débris*, absorption of septic material thus produced, and institution of new centres of tuberculous change on account of the poisoning of the lymphatics.

The special lessons concerning treatment inculcated by such considerations are—(1) to watch with great care inflammatory affections of the lung, however slight and apparently trivial, and never to feel satisfied until every trace of a local condensation has passed away; (2) to increase by every reasonable means, nutritive and medicinal, the powers of repair, so as to obviate the greatest danger in local affections of the lung—viz., the breaking down of tissue; (3) to prevent or arrest in whole or in part putrefactive decomposition in the lung structure. To this end I believe that antiseptic inhalations and antiseptic medicines are very valuable; but let no one imagine that they supplant the necessity for the adoption of means for promoting systemic nutrition, or for the careful treatment of intercurrent complications.—*Med. Times and Gazette, Dec.* 14, 1873, *p.* 648.

DISEASES OF THE URINARY ORGANS.

28.—OBSERVATIONS ON THE SKIM-MILK TREATMENT OF DIABETES MELLITUS.

By Dr. Arthur Scott Donkin, late Lecturer on Medical Jurisprudence and Toxicology in the University of Durham, late Physician to the Sunderland Infirmary.

I desire to be clearly understood as to what I mean by this term. To order the patient to drink as much skim-milk as he can, and whenever he chooses, regardless of measure, or the time of administration, or to permit him to partake of other kinds of food in addition, even in small quantities, is certainly *not* prescribing the skim-milk treatment. I have known so much as from sixteen to twenty-six pints swallowed daily by the patient, who was thus converted into a species of funnel, through the permission of his medical adviser. Of course it was not at all astonishing that this methodical but heroic administration of the remedy was *not* crowned with success.

By the skim-milk treatment, I mean the administration of skim-milk properly prepared, in quantities measured and limited to the requirements of individual cases, given at regular intervals in definite doses, and to the exclusion of all other food for a longer or shorter period. This system of treatment, in short, must be pursued in a strictly methodical manner, and according to the rules I have already laid down on this subject, and I must add, emphatically, *that if this is not done success must not be expected.*

On account of the scrupulous method, perseverance, and self-denial required, this treatment will never be attended with more than partial success in hospital practice, unless the patients are placed in isolated, special wards, and under the care of strictly trustworthy nurses. Of this I am convinced by my own personal experience in the cases of diabetes I treated in the Sunderland Infirmary. In all of these, without exception, no sooner was the sugar nearly or entirely removed from the urine, than the patients began to indulge clandestinely in the most injurious of the prohibited articles of food, and thus caused a return of the disease. The same observation applies with equal force to the more ignorant and unintelligent of the lower classes treated at their own homes, and to young subjects below the age of maturity. I fully concur with Bouchardat, that this cause exercises an important influence over the great mortality occurring amongst the latter class of patients.

The space at my command will only permit me, on the present occasion, to introduce to notice two additional cases, which may be regarded as typical illustrations of what can be achieved by the skim-milk treatment in a large majority of instances. In the first case the disease had not proceeded beyond the stage in which it is curable. The second, however, was too far advanced, and the vital powers too much impaired by the long continuance of the disease in a severe form, to permit of much hope of complete recovery, yet not so near the final period as to preclude the possibility of much improvement. I may mention that similarly beneficial results are not to be expected in cases complicated with tuberculosis or other necessarily fatal diseases; even although in these a great amelioration of the symptoms can generally be obtained.

Case of confirmed Diabetes; removal of the sugar from the urine in fifteen days; complete and permanent recovery.—This is the case of a gentleman, aged forty-seven years, suffering from diabetes, sent to consult me by his medical attendant, Mr. G. T. Keele, of St. Paul's-road, Highbury, London. The patient consulted me on the sixteenth of May, 1871, when I ascertained that the disease, then fully developed, had lasted at least two years, and probably longer, and was first detected about eighteen months previously, when he was slowly recovering from an attack of pleurisy. Shortly after this event, in consequence of overwork in commercial pursuits, and a severe attack of cold which aggravated the diabetes, his general health became seriously impaired, and he began to suffer so much from debility, that entire rest and change of air were recommended as essential for his recovery. Consequently he went to Tourquay and Hastings, whence he returned improved in health and spirits; but, unfortunately the urine continued as much loaded with sugar as before, and had a specific gravity of 1036. It is necessary to add that the diet of the patient had been restricted during this period and up to the time I first saw him.

At the date just mentioned, when the patient consulted me, he presented the usual symptoms of diabetes, but rendered less intense by the treatment to which he had been subjected. He had lost much flesh since the commencement of the disease; his urine had a specific gravity of 1040, and contained no less than 27·374 grains of sugar to the fluid ounce; the quantity voided daily being about six pints. He presented another symptom frequently observed in cases of confirmed diabetes—namely, a soft, spongy, painful condition of the gums, with looseness of the incisor teeth; a state indicating a deficient or unhealthy nutrition produced by a depraved blood, not only contaminated by an injurious foreign substance—sugar,—but also deficient in the products derived from the healthy assimilation of the proximate principles of food. This state of the gums is similar to that met with in scurvy, and apparently due to a similar cause.

On the 19th of May the patient was placed under the skim-milk treatment, *systematically* applied; and he, being a gentleman of superior intelligence, adhered most rigidly to the instructions received, and scrupulously followed the rules to be observed in applying this treatment.

The daily allowance of skim milk, having a specific gravity of 1038, was at first seven and then eight pints, divided into meals taken at regular intervals. No other food whatever was taken during the next six weeks, and during the whole treatment of this case not a single dose of medicine of any description was administered.

The progress of the case was watched from day to day by Mr. Keele, and the patient kept a table with the utmost precision, showing the state of the urine, which was daily examined for sugar by Moore's and Trommer's tests. The effect of the treatment on the urine during the first four weeks, is shown in the following table:—

May 16. *Urine contained* 27·374 *grains of sugar per ounce, specific gravity* 1040.

	Pints of urine daily.	Specific gravity.
May 19	4½	1037
„ 20	4½	1040
„ 21	5	1038
„ 22	4	1030
„ 23	4	1036
„ 24	4	1035
„ 25	3¼	1038
„ 26	2½	1035
„ 27	2½	1026
„ 28	3¼	1015
„ 29	3¼	1010
„ 30	2	1022
„ 31	3	1015
June 1	3	1012
„ 2	2¾	1015
„ 3	3¾	1009
(*No sugar.*)		
„ 4	2½	1022
„ 5	3¼	1006
„ 6	3¾	1015
„ 7	3½	1012
„ 8	4½	1006
„ 9	5	1006
„ 10	4	1006
„ 11	4½	1006
„ 12	5¼	1012
„ 13	3¼	1015
„ 14	4	1014
„ 15	4½	1013

During the following (last two) weeks of the purely skim-milk regimen the daily quantity of urine ranged from four to five pints, and its specific gravity varied from 1008 to 1015.

During the first three weeks of the treatment the patient went only for an hour daily to his office, spending the rest of the day in working in his garden. This occupation caused him to perspire more or less freely, and on some occasions most profusely. It thus produced the considerable variation in the daily quantity and specific gravity of the urine especially observable in the second and the third weeks, and the smallness of its quantity compared with that of the skim-milk taken during that period. This was particularly observable on the 30th of May and 4th of June.

There was not much diminution in the quantity of urine or sugar, nor other improvement, during the first week, but from the beginning of the second it commenced to subside rapidly until on *the fifteenth day of the treatment, June 3rd, it had entirely disappeared.* On this day the quantity of urine was three pints and three-quarters, and its specific gravity 1009.

It is necessary here to record that from the first day of the treatment on the 19th of May to the 15th of June the patient lost weight, at first rapidly and afterwards slowly; so that in the space of twenty-eight days he lost fourteen pounds, notwithstanding the fact that at the end of this period he felt very much stronger and better. There can be no doubt that this loss of weight can, to the extent of a few pounds during the first fortnight at least, be accounted for by the much smaller quantity of fæcal matter contained in the intestines under a skim-milk regimen than under an ordinary solid diet, and by the removal of the sugar from the blood, fluids, and tissues previously saturated with this heavy substance, which thus adds considerably to the weight of the entire body. But it would appear also that, independently of these causes, the body had lost weight.

During the whole period of the treatment the pulse was natural, and ranged from 66 to 70.

At the end of the third week June 8th—a week after the disappearance of the sugar from the urine—the state of the gums had very much improved, and the teeth had become firmer. At the end of the fourth week (June 15) the patient began to take an additional two or three pints of skim-milk made into curd, daily, by the essence of rennet, a pint for each meal.

At the end of the sixth week (28th June) he was allowed a small steak for dinner, and on the following day took fish and butcher-meat in addition to the skim-milk and curd. This change in the diet did not cause the slightest return of sugar in the urine, and the patient now, to use his own expression, felt "well and hearty."

On the 1st of July he began to indulge in forbidden articles of food containing large quantities of starch and sugar, and some sugar again appeared in the urine, but rapidly disappeared again on his resuming the skim-milk diet for three or four days.

From this time onwards the patient took solid animal food at breakfast, dinner, and supper, in addition to the skim-milk, which he drank largely at meals instead of water, and which thus continued, and is still continued, as a staple article of food; he also took a Blatchley's bran-biscuit at each meal, but this was afterwards superseded by the use of gluten bread. The animal food was of great variety—namely, beef, mutton, veal, lamb, tongue, lean ham, chicken, turkey, game, eggs, lobster, shrimps, and fish in every variety. He was also allowed every description of green vegetables, including even asparagus and French beans. But saccharine and starchy food, and butter, bacon, and fatty substances and cheese, were forbidden. The dietary was thus most varied and generous, and contained all the proximate alimentary principles, and everything else requisite for the healthy nutrition of the body.

Up to this period alcoholic drinks had been strictly prohibited, but in September the patient began of his own accord to take dry sherry, claret, Burgundy, Scotch whisky, or brandy in moderate quantity daily, and felt very much better in consequence, and without any return of sugar in the urine.

On the 12th of October I examined the patient at his own house, in consultation with Mr. Keele, when we found him entirely free from the disease. He felt remarkably well, and his urine did not contain the slightest trace of sugar, notwithstanding the fact that for three months previously he had attended closely to his office and to business for several hours daily. His diet at this period was that which I have just described.

In accordance with advice given he started early in the following month—November—to spend the winter in the south of Europe. He remained some time at Mentone, spending the day-time chiefly in taking exercise in the open air, feeling all the while healthy and vigorous, and living on the same generous diet as previously. He then visited Venice, Rome, and Naples, and returned home through Spain and France. I saw him in April last, 1872, after his return; he was wonderfully improved in appearance and was in excellent health. During the past summer he took a tour into Sweden, and felt benefited thereby. I will only add that not only does the patient continue free from disease, but he even appears to be better than he was previous to his having become affected by it. Thus, in a letter written on the 16th of October last, nearly sixteen months after his recovery, he wrote to me saying, "I am at present better and stronger than I have been for years."

There can be no doubt whatever that a long holiday with plenty of exercise, under a genial atmosphere, with change of scenery and complete relaxation from business, contributed powerfully to confirm the health of the patient.

I am the more anxious to direct attention to this circumstance, having ascertained by experience in similar cases that hygiene and relaxation from business or professional pursuits for a considerable period are of the utmost importance in the after-treatment of diabetes, when convalescence has been fairly established. I can point at least to one melancholy instance in which a return of the disease in severe form was induced by close attention to business in gloomy premises, and continued residence in an unhealthy atmosphere, nearly a year after every trace of sugar had been removed from the urine, and the health and strength of the patient completely restored.

If space had permitted I would have cited other instances, in addition to the above and the other cases already published in my previous contributions, to show the remarkable efficacy of the skim-milk treatment of diabetes—*properly applied.* But these are certainly sufficient to carry conviction to an unprejudiced mind that the disease is quite amenable to treatment if the remedy *is applied in time.*

In cases of diabetes too far advanced to admit of cure and the consequent removal of the sugar completely from the urine, the skim-milk treatment will reduce the quantity of sugar to a very much greater degree, and hold the disease in check far more powerfully than any other remedy yet discovered, to say nothing of the subjugation of the more distressing symptoms, as already described in my previous contributions. In illustration of this effect in such instances, I will cite the following case, in which a diet restricted (except the lactine of milk) to purely nitrogenous substances, was subjected to a lengthened trial in the first instance, and then an exclusive regimen of skim-milk.

W. B., aged sixty years, lost his health two years ago, when he was obliged to give up work, and began to lose flesh and weight rapidly (his weight at that period having been 15 st., but now reduced to 8 st. 13 lbs., showing a loss of 5 st. 13 lbs. up to the present time). At the commencement of his illness his appetite greatly increased, and he began to suffer from excessive thirst, great debility and loss of muscular power, a greatly increased flow of urine, and a dry skin. These symptoms have since gone on gradually increasing. The large flow of urine induced him to remark to his medical attendants that his blood was going to water, but still the disease remained undetected until it was recognised by another practitioner in April, 1872, or eighteen months after the health of the patient broke down. When closely questioned on the subject, the patient stated distinctly that long prior to the period he fixed as the beginning of his illness (when he could no longer work) he suffered much from debility, weakness of the limbs, and general indisposition. The disease, therefore, as usual, appears to have come on insidiously, and to have had its origin at a date long anterior to the period when it became so fully developed as to cause a complete break down in the patient's health, and the accompanying great emaciation and other distressing symptoms indicative of an advanced stage of the malady.

When I first saw the patient on the 10th August, 1872, he suffered from the symptoms just enumerated, and complained much of weakness and diminished sensibility of the limbs and loss of sensation in the feet, almost complete in the soles, so that his gait, with the assistance of a stick, was very unsteady. For months previously he had confined himself to a diet consisting of 1½ lb. of beef or mutton, green vegetables, and a moderate quantity of ship-biscuit, and a quart of milk daily; he also drank water. He was passing from 8 to 9 pints of urine having a density of 1040, and (on the 10th of August) containing 21·247 grs. of sugar to the fluid ounce.

He was now placed on a restricted diet consisting of 1 lb. of lean chop or steak, taken at breakfast and dinner, three or four pieces of gluten bread, and from 7 to 8 pints of skim-milk, daily. All saccharine and starchy matter (except the lactine of skim-milk) and fat in a great measure were thus excluded. This regimen was strictly adhered to for a period of nine weeks, but with only slight improvement in the condition of the patient, so that on the 12th of October he was voiding 7½ pints of urine, specific gravity 1038, and containing 25·340 gr. of sugar to the fluid ounce.

He was now subjected to an exclusive skim-milk diet (9 to 10 pints daily, 3 pints being made into curd, and taken at three meals). The following table shows the result on the disease, as revealed by the rapid and remarkable diminution in the quantity of urine-sugar. I must add that the quantitative estimation of the sugar was made by the beautiful polarising saccharimeter of Soleil, perfected by the manufacturer, Duboscq, of Paris, by which the most exact results are easily obtained.

Diet restricted to meat, gluten, bread and skim-milk, end of ninth week.	Pints of urine daily.	Specific gravity.	Grains of sugar per fluid oz.
12th October	7½	1038	25·340
Exclusive skim-milk diet begun 12th October.			
16th October	6	1030	19·797
22d "	6	1021	12·670
26th "	6½	1015	7·419
30th "	6½	1020	9·502
1st November	5½	1020	10·294
4th "	6	1015	7·127
8th "	5	1012	2·771
12th "	5¼	1007	1·588
18th "	4¾	1010	2·375

It will thus be observed that in the space of thirty-six days the skim-milk treatment gradually reduced the quantity of urine sugar from 25·340 gr. to 2·375 gr. per fluid ounce of urine—a diminution equivalent to 22·965 gr. per ounce, and at the same time decreased the daily quantity of urine to the extent of 2¾ pints.

This case is not only of very great importance in illustrating the remarkable potency of skim-milk in checking the disease and preventing the formation of sugar, but it is extremely valuable in demonstrating, in the clearest possible manner, the fact that skim-milk loses its curative power altogether, and becomes valueless as a remedy, in diabetes, when administered in combination with solid animal or other nitrogenous food. I have repeated the experiment over and over again, with every variety of modification, in similar cases, and always with the same result.

I may add that the improvement in the general health of the patient, and in the more important or distressing symptoms, especially in the loss of sensation in the feet and legs, has been quite commensurate with the decrease of the urine-sugar. He now walks steadily and with a firm step. He is still under treatment; but a complete recovery is scarcely to be expected.

In the treatment of diabetes it must be remembered that the source of the urine-sugar is the food. The most remarkable pathological character of the disease is its power of *misappropriating* the proximate principles of food required for the nutrition of the body and the production of animal heat, converting them into an unassimilable substance incapable of oxidation—namely, diabetic sugar, which is cast out of the system by the kidneys as a useless and injurious foreign substance.

At first there is only a *partial* malassimilation of starchy and saccharine substances, but this becomes *complete* as the disease advances. Next comes a period when the fatty matter of the food is likewise converted into sugar; and when this stage of the disease is fully developed the whole of the carbonaceous alimentary principles are misapplied, instead of being assimilated and undergoing their normal metamorphic changes. Consequently they are not oxidised, and the temperature of the body falls below the healthy standard. Unfortunately this is not all, for if the disease runs its course unchecked it passes into a much more serious phase of its progress, and the albuminous or nitrogenous principles of the food also begin to contribute to the formation of diabetic sugar, and in quantity gradually increasing as the disease advances towards its termination, until a very small proportion is left to nourish the tissues and maintain the heat of the body. Thus, Professor Greisinger found, by careful experiment on a diabetic patient restricted to rigorous meat diet, that only *two-fifths* of the whole of the albumen consumed in the food remained available for the purpose of nutrition, the rest being converted into diabetic sugar. But this does not even represent the full extent of the malassimilation of albumen in very advanced cases.

These data supply a ready and intelligible explanation of the gradually increasing and at length extreme emaciation observed in diabetics, accompanied *not* by pyrexia, but an abnormally low temperature of the body, the latter condition being due to the complete absence from the blood of the oxidisable products of the assimilation of the carbonaceous principles of the food, and the great deficiency of those derived from the albuminous. Hence we can readily understand the fact shown by the recent investigations of Pettenkofer and Voit, that in diabetes there is a diminished consumption of oxygen, and a correspondently decreased production of carbonic acid by the process of respiration.

I have already referred to the necessity on the part of diabetics to refrain from starchy and saccharine articles of food, in order to prevent a return of the disease after recovery. The prohibition of bread from the regimen thus prescribed is generally complained of as the greatest hardship to be endured; consequently, various substitutes have from time to time been invented. Thus we have the gluten bread first suggested by Bouchardat, and the bran biscuits made according to different formulæ; the former, however, is insipid and unpalatable, while the latter, when free from starch, are composed entirely of *lignine*, and, therefore, contain no nutriment whatever. To obviate these serious objections, it struck me that a very important end would be gained if a kind of diabetic bread could be manufactured consisting of an admixture of gluten and bran. I therefore communicated with Mr. Van Abbott, of Princes-street, Cavendish-square, on the subject, and he has succeeded in getting manufactured in France, after much difficulty, a bread consisting of 80 per cent. of gluten and 20 per cent. of bran nearly free from starch, and a very small quantity of butter. This bread is a much closer approximation to ordinary brown bread than any other substitute now in use. It is not only agreeable and palatable to the patient, as well as nutritious on account of the large proportion of gluten, but, what is also very important, it excites the peristaltic action of the bowels, and prevents or corrects constipation in consequence of the *lignine* it contains in the form of bran. I have no hesitation in saying that this bread is much superior to any other form hitherto produced for the use of diabetics.

In closing this series of contributions, I may state that I have conducted some experiments with lactic acid in the treatment of diabetes, but find it possesses no specific action on the disease apart from the strict animal regimen in conjunction with which it is administered. I intend at a future period to publish my experience on this subject.—*Lancet, Jan.* 11 *and* 18, 1873, *pp.* 45, 86.

29.—ON THE PATHOLOGY AND DIAGNOSIS OF ACUTE BRIGHT'S DISEASE.

By Dr. George Johnson, F.R.S., Physician to King's College Hospital.

While acute Bright's disease is usually associated with a more or less copious epithelial desquamation, there may be no desquamation of renal epithelium, and either no tube-casts or only small hyaline casts in the urine; while in other cases, either with or without epithelial casts, there may be casts crowded with small exudation-cells. The appearances which I have described are sharply defined in some cases, while in others they gradually merge into each other. Epithelial casts and desquamation may be abundant or entirely absent, or present in moderate amount. The casts with exudation cells may be numerous and unassociated with epithelial casts, or the two forms of tube-casts may be combined with and replace each other in variable proportions. It is certainly interesting, and, I think, of some practical importance, to note these different appearances in the urine.

In all the cases of acute Bright's disease to which I have hitherto referred, although the microscopical appearances in the urine are various, the general symptoms and the physical and chemical characters of the secretion are alike, and in particular the presence of a large amount of albumen is a constant phenomenon. Now, I have to tell you that we sometimes, though rarely, meet with cases of acute general dropsy in which the urine, although scanty, contains not a trace of albumen. In the great majority of cases acute Bright's disease and acute albuminuria are synonymous terms; but in these few exceptional cases the latter term is inapplicable, for the urine is not albuminous. Dr. Blackall described two cases of acute general dropsy after scarlet fever, in which the urine was not coagulable either by heat or by nitric, or, as he calls it, "nitrous" acid (*op. cit.*, p. 12 to 21). Dr. Roberts gives the history of two cases after scarlet fever, both fatal—one acute, the other chronic (On Urinary and Renal Diseases, pp. 24 and 400). Dr. Basham has recorded the case of an adult in whom general dropsy followed exposure to wet and cold. He recovered (Lancet, August 1867). And I have notes of four cases that have come under my own observation. Three of these cases recovered, and the fourth was improving when he was lost sight of. In two of my cases the dropsy followed scarlet fever, and in the other two it was probably a result of exposure to cold. In two of the cases neither albumen nor tube-casts could be discovered throughout; n one a trace of albumen was found on one occasion; and in the fourth, after general dropsy had existed for six weeks without albumen or tube-casts a trace of albumen and some hyaline casts appeared.

Now what is the explanation of these rare, remarkable, and exceptional cases? I have neither seen nor heard of any satisfactory explanation of them, and I am not prepared to give you one; but I venture upon one or two suggestions and queries. There is reason to believe that suppressed action of the skin is a powerful concurring cause of the dropsy which is associated with albuminuria; and this, perhaps, is the explanation of the frequent association of dropsy with the renal disease which results from scarlet fever or from exposure to cold and wet. In both these classes of cases the functions of the skin must obviously be more or less impaired—in the one by the specific inflammation, and in the other by cold; whereas diphtheritic albuminuria, without implication of the skin in the morbid process, rarely, if ever, gives rise to general dropsy. Then the question arises, Is it possible that suppression of the cutaneous secretion may alone cause acute general dropsy without the implication of the kidneys? May acute general dropsy result from a metastasis of the perspiration from the skin to the areolar tissue and the serous membranes? And may the scanty secretion of urine in these exceptional cases be a result of the morbid transfer of water to the tissues where the dropsical effusion takes place, as, by a reversed action, the perspiration is checked and the skin of a diabetic patient rendered dry by the copious flux of liquid through the kidneys? I am not prepared to answer these questions. In most cases of acute dropsy without albuminuria the urine has been scanty and high coloured. In one of Dr. Roberts's cases the urine was scanty almost to suppression, only two drachms having been voided in twenty-four hours; "it contained casts, but not a trace of albumen." The form of tube-casts is not mentioned. The total quantity of urine voided during the last seven days of life amounted to between six and seven ounces. No autopsy was permitted. In the second case the urine contained neither albumen nor casts, but it was scanty and high coloured; and, death having occurred after an illness of five months, "the kidneys were found to be good examples of the smooth white Bright's kidney." In this case it would seem that, although there was no albuminuria, there was some structural change in the kidneys. Dr. Wilks has published in the sixth volume of the Pathological Transactions a remarkable case of general dropsy, with a peculiar form of renal disease, but without albuminuria, in a woman aged 35. The urine passed amounted to about twelve ounces in the day, of specific gravity 1012, and not albuminous. A few days before death the urine became less in quantity, and for the last four days none was obtained. The kidneys were pale and large, their combined weight being seventeen ounces. The cortical portion was seen by the naked eye to be scattered over with small round dots like grains of sand. On a microscopic examination these were found to be the Malpighian bodies, the capillaries of which were covered over with mulberry-like masses of oil-globules, while the tubes were healthy.

It may hereafter happen to some of you to have the opportunity of throwing additional light upon the pathology of these rare and exceptional cases of general dropsy not dependent on heart-disease and unassociated with albuminuria.

We have seen that the chief varieties and modifications of acute Bright's disease with albuminuria are the following:—1, with epithelial desquamation (desquamative nephritis); 2, without desquamation, either with or without small hyaline casts; 3, with exudation-cell casts, either with or without epithelial casts and desquamation. Lastly, we have, as an entirely distinct class of cases, rare, exceptional, and obscure in their pathology, acute Bright's disease, or at any rate acute general and febrile dropsy, without albuminuria.

Changes in the Blood.—The effect of acute Bright's disease is not only to cause an admixture of blood-constituents with the urine, but also to bring about a large accumulation of urinary materials in the blood. While the urine is usually more or less bloody, the blood becomes in a greater or less degree urinous. Dr. Christison was the first to announce the fact that the blood in these cases contains a large amount of urea, and that urea is found in the dropsical and inflammatory effusions (Edinburgh Medical and Surgical Journal, October 1829). Not only is the blood altered by an accumulation of urinary materials, but also by a loss of its own normal constituents. The density of the serum is reduced from 1030 or 1031 to 1022 or even 1020. The loss of density is greatest when the urine has been most albuminous; and it is probably explained by the escape of serum through the kidneys. The hæmoglobin or colouring matter also diminishes rapidly, the normal proportion being 1,335 in 10,000. Dr. Christison found it reduced, after a few weeks' illness, as low as 955 in one case, in another to 564; and in a young man ill for three months and a half subsequent to scarlet fever, who had never been bled before, it was only 427. At the commencement of the disease the loss of colouring matter is less rapid than the extreme pallor of the patient would seem to indicate; and it is probable that the blanched appearance of the skin is partly occasioned by the quantity of water in the subcutaneous tissue.

Etiology.—Acute Bright's disease may occur at all ages from infancy to extreme old age. The two most frequent causes of acute Bright's disease with dropsy are exposure to wet and cold and scarlet fever. Either of these causes is alone sufficient to excite the disease; but their combined action—exposure to cold during the progress of scarlet fever—is a most powerful determining cause of the malady. Diphtheria is a frequent cause of albuminuria; but, as I have before said, diphtheritic albuminuria is rarely associated with dropsy. Amongst the less frequent causes of acute albuminuria are measles, erysipelas, pyæmia, the absorption of poisonous materials from the uterus after parturition, rheumatic fever, the malarious poison, typhus and typhoid fever, cholera, and, lastly, excessive eating and drinking, more especially when combined with dyspepsia. In the majority of cases acute albuminuria, resulting from other causes than scarlet fever and exposure to cold, is unassociated with dropsy, and its history belongs to that of the disease with which it is associated as a complication. We shall find hereafter that albuminuria resulting from one or other of the various causes here referred to sometimes leads to a chronic and incurable degeneration of the kidney. Excess of alcohol is a more frequent cause of chronic than of acute Bright's disease. A remarkable case of transient alcoholic albuminuria occurred when Dr. Baxter was house-physician to our hospital. A man between twenty and thirty years of age was brought in one night by the police. He was unconscious, and breathing stertorously. He was believed to be drunk, and a large quantity of vinous liquor was pumped out of his stomach. The unconsciousness remaining, uræmia was suspected, and some urine drawn off with the catheter was "loaded with albumen." He was then put into bed, cupped over the loins, and a purgative given. When Dr. Baxter visited the ward in the morning he found the man sitting up and clamouring for his discharge. He said that he had been very drunk over-night, but now he had nothing the matter with him. He passed some urine, which was found of normal colour and specific gravity, and without a trace of albumen. He then left the hospital in triumph. The temporary albuminuria was the result of renal congestion while the excess of alcohol was being excreted by the kidneys.

Diagnosis.—In most cases of acute Bright's disease the symptoms are so obvious, that the disease can scarcely be overlooked or mistaken for any other. The only cases in which there is a possibility of acute albuminuria being unrecognised are those in which it is unassociated with dropsy. But, the existence of albuminuria being discovered, it is not always easy to determine whether this is the result of a recent acute attack, or of a chronic degeneration of the kidney. We shall be in a better position to discuss this important practical question after we have studied the various forms of chronic Bright's disease. Meanwhile, however, I may tell you that, as a rule, high coloured, smoky, and blood-tinged urine, of high specific gravity, is an indication of a recent acute attack; and equally so is a copious sediment composed of epithelial and blood-casts, or of exudation-cell casts, alone or mixed with epithelial casts. The appearance of oily casts and cells, in combination with numerous epithelial casts, does not materially affect the diagnosis. On the other hand, urine of low specific gravity and very pale in colour, yet highly albuminous, is usually evidence of chronic disease; and this evidence is strengthened by the appearance of numerous oily casts and cells unassociated with epithelial or exudation-cell casts. Large hyaline casts in *pale* highly albuminous urine point to disease not only chronic, but in an advanced stage. We shall return to this subject, and discuss it more fully in a future lecture.

Prognosis.—Acute Bright's disease has a tendency to terminate in complete recovery. It is essentially a curable disease, as much so as acute bronchitis or acute pneumonia. The earlier the patient comes under treatment the better is his prospect of recovery; and, on the other hand, the longer the symptoms have continued without signs of amendment, the more grave does the prognosis become. The prognosis is, on the whole, more favourable in the young and middle-aged than in those more advanced in years; but the disease may prove mild and tractable even in very aged persons. For obvious reasons, the prospect of recovery is better in the case of those who can avoid exposure to cold and other injurious influences, than when the patients' circumstances are less favourable.

In favourable cases a copious secretion of urine, of comparatively low specific gravity and of paler colour, with a diminishing amount of albumen and decrease of dropsy, are amongst the earliest signs of amendment. Albuminuria is usually the last symptom to disappear. The time of its disappearance varies, in different cases of recovery, from a few days to many months. If the urine continue albuminous for more than six months, it becomes more and more doubtful whether it will ever cease to be so; but I have seen cases of complete recovery after albuminuria had continued for one, two, and even three years. So long as the urine continues albuminous, in however slight a degree, although the dropsy and all other general symptoms may have passed away, recovery must be considered incomplete. Acute Bright's disease, although, as a rule, a curable, is not unfrequently a fatal disease. There are some symptoms and complications which indicate a case of more than ordinary peril; such as a very scanty secretion of highly albuminous urine; frequent and distressing vomiting; great anasarca, with a tendency to erysipelatous inflammation of the skin; dropsical effusion within the chest, either in the pleura or the pericardium, or both, with urgent dyspnœa; inflammation of the lung, or pleura, or pericardium, or endocardium; severe and persistent headache, which is apt to be followed by convulsions and by coma, with a brown and dry tongue. All these are symptoms of grave, though not always of fatal import. When the renal disease is acute, and therefore essentially curable, recovery sometimes occurs after the most formidable symptoms of uræmic poisoning have been present.

A consideration of the exciting causes of the renal disease forms an element in the prognostic indications. When Bright's disease results from some inherent constitutional defect, without obvious exciting cause, it is generally more intractable than when it is directly due to exposure to cold or to the influence of some specific blood-poison, as, for instance, that of scarlet fever or erysipelas. To all general rules of this kind there are exceptions, and each case requires a separate and careful study.

Let me impress upon you one point of practical importance. Before you pronounce a patient to be entirely free from his malady, be careful to test the urine, not only after rest and fasting—*i.e.*, in the morning before breakfast—but after food and exercise. Albuminous urine is usually more copiously so after food and exercise; and you will sometimes find that, while the urine before breakfast is quite free from albumen, that which is secreted after a meal is decidedly and even copiously albuminous. In some cases exercise has even more influence than food in exciting renal congestion and albuminuria.

An attack of acute Bright's disease confers no immunity from future attacks; on the contrary, the disease may occur more than once in the same subject, a result of either inexplicable predisposition, or of a liability resulting from a first attack. I think my experience warrants the statement that when acute albuminuria has resulted from some non-specific cause, such as exposure to cold and wet, or excessive eating and drinking, it is more likely to recur than when it has been excited by a specific morbid poison, such as that of scarlet fever, which, as a rule, does not occur a second time in the same individual; but I have known patients so unfortunate as to have two attacks of scarlet fever, and each attack complicated with albuminuria.—*British Medical Journal, Feb.* 1, 1873, *p.* 109.

30.—DIGITALIS IN DROPSY.

[A correspondent of the Medical Times and Gazette says:]

I am induced to send you the following in hopes that others may follow my example, especially with regard to the uses of the same remedy. The value of digitalis in certain forms of dropsy is well known, and I would hardly venture to put before you the following notes were it not for the plans adopted for employing this remedy.

A woman of middle age was brought to the hospital after she had been confined to bed for some time for dropsy. According to her own statement she had passed no urine for forty-eight hours previous to admission; certain it is that in eighteen hours after admission only eight ounces could be got away by the catheter. There was a good deal of dropsical effusion under the skin in various parts, especially in the walls of the abdomen and in the breasts. The urine was highly albuminous when tested after withdrawal by catheter. Under the circumstances it was necessary to get the kidneys to act, and I ordered to be applied to her loins, over the kidneys, an ounce of the tincture of digitalis on a piece of lint, to be covered over carefully, and to be renewed in four hours. The result was most satisfactory: urine began to flow profusely, and before long far exceeded the normal quantity. Had it been possible to procure the fresh leaves, I should of course have used them, but they were not to be had.

The other instance is a man with contracted kidneys and no dropsy, who from time to time becomes drowsy, and subject to fearful convulsions. In his case, too, nothing suits so well as digitalis; but when he becomes insensible, the very time he ought to take it, it cannot be given. Under such circumstances I commonly reduce a quarter of a grain of extract of digitalis with water, and inject it under the skin of the arm. This, as a rule, makes the urine flow freely, and the patient gradually comes round.—*Medical Times and Gazette, Jan.* 1873, *p.* 71.

31.—ALCOHOL AS A CAUSE OF RENAL DISEASE.

By Dr. W. H. Dickinson, Senior Assistant Physician to St. George's Hospital, &c.

[The question discussed in this paper is whether the abuse of alcohol really ranks so high as a cause of renal disease as has generally been supposed. As an instance of the prevalence of the opinion that alcohol does so act, the following sentence occurs in the recent work on renal disease by Dr. William Roberts, of Manchester—"The abuse of spirituous liquors ranks high—probably higher than any other single circumstance—as a determining cause of Bright's disease." The result of more close investigation of the subject, however, is that alcoholism does not increase renal disease, however it affects other organs. Dr. Dickinson gives in a tabular form "An Analysis of the state of the Kidney, as found after Death, in 149 persons following Alcoholic Trades, and in the same number of persons circumstanced otherwise;" to which another table is appended, showing how often symptoms were observed pointing to the kidney. He says:]

It will be at once seen that the kidney in the two classes shows no great disparity—a disparity far less than is exhibited by other organs. The total of kidney-disease is not increased by the alcoholic trades. The uniform changes of cortex which tend to albuminuria were slightly, and but slightly, more frequent under liquor, occurring in 86 persons of the alcoholic to 82 of the opposite series. The most marked increase under alcohol was with kidneys described as enlarged and congested, or large and coarse, conditions often undeclared during life. Granulation was also increased, but not to the same extent as cirrhosis, its hepatic analogue. Associated with, but not entirely dependent upon, this increase, there was also under alcohol a marked preponderance of cerebral apoplexy and hypertrophy of the heart, results of vascular deterioration.

Under the same influence of alcoholic trade, the "large, smooth, mottled kidney" (a description which may refer either to advanced tubal nephritis or to lardaceous infiltration) was diminished, as also was the lardaceous change of a distinctly recognisable sort. Thus the more rapid and obvious forms of renal disorder were in abeyance. Such increase as occurred was insidious and latent—rather exposed after death than traceable during life. Dropsy, external or internal, discovered albuminuria, and death directly attributable to the kidneys, were less frequent with liquor than without. Cerebral uræmia, the natural ending of granular degeneration, preponderated on the other side.

In deducing the effects of alcohol from this comparison, it is necessary to allow for the somewhat lessened exposure to weather, and also to accidental violence, involved in the alcoholic pursuits—exemptions which, so far as they go, would diminish the liability to tubal nephritis and to lardaceous change. This may help to explain the comparative rarity of these disorders with the alcoholic class. The increase in fibroid and chronic tubal changes must be referred to the liquor alone; but this increase is not great.

Taking all facts together, I do not see how it can be doubted that the effects of alcohol in causing renal disease is less than used to be asserted: that this agent does not rank higher, but lower, than other circumstances—to wit, external temperature and the absorption of lead—as a determining cause of Bright's disease. Although we can now and then trace the existence or aggravation of renal symptoms to intemperance, we do so with far less frequency than with disorders which have other sites. Pathological and clinical evidence combine to show that the evil influence tells more upon the nervous system, the liver, the blood-vessels, and probably in the production of tuberculosis, than upon the kidneys. The facts adduced are consistent with those formerly advanced, and with the quoted conclusions which have been the object of attack.—*British Medical Journal*, *Nov.* 23, 1872, *p.* 575.

SURGERY.

FRACTURES, DISLOCATIONS, AND DISEASES OF THE BONES, JOINTS, &c.

32.—ON COLLES' FRACTURE OF THE RADIUS, AND ITS TREATMENT.

By Dr. J. Alexander Macdonald, Belfast.

[Few fractures have had so many ingenious splints devised for their treatment; yet, in spite of the utmost care, many cases of this fracture turn out unsatisfactorily. Its true pathology was unknown until 1814 when it was described by the eminent surgeon whose name it bears. Previously it had been mistaken for dislocation of the wrist backwards. In 1850 Dr. R. W. Smith, of Dublin, published his treatise on fractures in the vicinity of joints. Dr. Gordon's mode of treatment by his splint was published in 1861. (*Retrospect*, vol. xliv., p. 86).]

The seat of the fracture is about an inch above the styloid process and generally transverse; occasionally, however, presenting some degree of obliquity in its course, either downwards and inwards or downwards and outwards.

Referring to the bones of the forearm as they appear *in situ*, we observe the normal concavity of the radius anteriorly; the direction of its carpal extremity forwards and inwards; and the difference in length between its anterior and posterior surfaces, amounting, on an average of specimens, to nearly half an inch.

On the occurrence of the accident, we have the following results; viz., the natural concavity of the radius is lost; its distal extremity, with the carpus attached (in consequence of the unopposed action of the supinator and long extensors) is carried backwards, outwards, and upwards; while the length of the bone anteriorly is augmented in a ratio corresponding to the interval between the fragments, and the interosseous space diminished by the approximation of the upper fragment towards the ulna by the pronator quadratus.

Accepting the above as the pathological conditions presented to us, we have to consider by what means we may best obviate them in endeavoring, first, to restore the form of the radius; second, to bring back its carpal extremity to its proper aspect, *forwards and inwards;* and, thirdly (as a consequence of the preceding steps), to remove the obstacles to the reunion of the opposed surfaces, and, if possible, secure the normal length of the bone (radius) before and behind. How difficult of accomplishment this last point is, may be inferred from Dr. R. W. Smith's testimony that, out of twenty cases of fracture of the lower end of the radius, in none had the normal length been restored; in all, the anterior surface exceeded the posterior. These several desiderata have been met by the apparatus known as Gordon's splint, in which the normal curve of the bone is taken as a guide, and the radius thereby forced to assume its proper form and relations; while the carpal surface is directed downwards, the hand being moderately adducted, and midway between pronation and supination finally. They are easy of application; and the feeling of comfort experienced from the support thereby afforded is marked, when contrasted with any other form of splint in ordinary use. To them the motto "Cito, tuto, et jucundè," seems especially applicable; and by their employment the *opprobria* of stiffness, &c.,

are almost entirely unknown. For additional testimony to their value since Dr. Gordon's paper first appeared in the Dublin Medical Journal in 1865, I would refer to a communication to the Medical Times and Gazette in the year following by Mr. Lawson Tait, by whom they were again brought under the notice of the profession. (*Retrospect*, vol. liii, p. 123.) In a recent letter to me, he repeats his favorable opinion, fortified by increased observation of more than fifty successful cases, and the too frequently unsatisfactory results of ordinary treatment.

The splints are made by Sloan, Israel Street, Belfast.—*British Medical Journal, March* 1, 1873, *p.* 223.

33.—ON A NEW METHOD OF EXCISING THE ELBOW-JOINT IN CASES OF ANCHYLOSIS.

By Thomas Annandale, Esq., F.R.S.E., Surgeon to the Edinburgh Infirmary, and Lecturer on Clinical Surgery.

The importance of disturbing as little as possible the attachments of the muscles in excising the elbow-joint is one of the recognised principles of the operation. In cases of extensive disease of the joint, a free exposure and removal of the affected surfaces are necessary; but in cases of anchylosis without actual disease, such free exposure and removal are not, in my opinion, required; and are, therefore, liable to the objection that they necessitate more division of the surrounding muscular connexions than is absolutely essential. The very satisfactory results I have obtained in several cases of compound fracture or dislocation of the lower end of the humerus by the "primary" removal of the injured bone and the tip of the olecranon, without interference with the head of the ulna or radius, have led me to this latter opinion; and I therefore think that in many cases of anchylosis of the elbow-joint, the removal of only a portion of the lower extremity of the humerus, together with any new osseous material likely to interfere with the future mobility of the joint, will be more likely to afford a satisfactory result as regards the usefulness of the arm. If this principle is correct, it has the great advantage that it leaves the attachments of the important muscles connected with the olecranon, coronoid process, and the head of the radius uninterfered with, and is, therefore, certain to make the operation more complete in its results. It is well known that a limited removal of the bones in excision of the elbow-joint is often followed by unfavorable results as regards the mobility of the new joint; but as such bad results usually depend in great measure upon a gradual contraction or shortening of the surrounding muscles and other soft textures, in consequence of their free division during the operation, it seems to me that a less free division of these textures will limit such contraction, and thus make it unnecessary to remove so great an amount of bone. This remark can, of course, only apply to cases where disease is absent or very limited.

Having lately to perform excision of this joint in a case of anchylosis following an old-standing injury, I endeavoured to carry out the principle advanced by performing the operation in a manner which, so far as I am aware, has not previously been suggested.

Two lateral incisions, about four inches in length, having their centres opposite the middle third of the olecranon, were first made on the posterior aspect of the joint, and the internal incision running parallel and a few lines external to the ulnar nerve, the external one running in the same direction and a little internal to the prominence of the external condyle. The ulnar nerve, together with the skin and other textures around it, was then carefully separated from its position, and drawn inwards by means of a blunt hook, and the exposure of the bones connected with the joint continued, partly from the internal and partly from the external incision, by dissection, the knife being kept close to the periosteum. In this way the muscles and other soft textures were together separated from the lower end of the humerus and condyles, the attachment of the triceps brachialis anticus and byceps muscles being left untouched. The tip of the olecranon was next removed, the ligaments of the joint, some fibrous adhesions and new osseous material divided, and a copper spatula having been passed between the anterior aspect of the joint and the separated textures, the lower end of the humerus was sawn through with a narrow saw, and removed together with its condyles. As the head of the radius did not move freely at its articulation with the ulna, owing to some strong adhesions, the knife was carried round it so as to divide these bands, and a thin slice of its articular surface was sawn off. The removal with the bone forceps of some small portions of new osseous material completed the operation. Two or three small arteries were ligatured, and the edges of the wound brought together in the usual way.

In this operation no attempt was made to save the periosteum, because the subperiosteal method of excising the elbow-joint is not, in my opinion, advisable; the formation of too much new osseous matter making its results, as regards the mobility of the parts, unsatisfactory in many cases.

Should I require to operate in a case where the anchylosis was more completely osseous, I would, after separating the soft parts in the way described, introduce the narrow saw under the triceps muscle close to its insertion into the olecranon, saw completely through the anchylosed joint, and then remove as much of the lower end of the humerus as seemed necessary. If the radius and ulna still remained fixed together, I should endeavour to separate and free them without interfering with the olecranon or coronoid processes or their representatives, should they have been destroyed or obscured in the progress of the case.—*Lancet, Dec.* 21, 1872, *p.* 877.

84.—ON SOME OF THE MORE RECENT METHODS OF TREATING WOUNDS ON ANTISEPTIC PRINCIPLES.

By DAVID J. HAMILTON, Esq., Junior House-Surgeon, Northern Hospital, Liverpool; formerly Resident-Surgeon to the Royal Infirmary, Edinburgh.

[It is difficult for those not in connection with a large hospital to keep informed as to the progress of antiseptic surgery.]

The following short and merely practical remarks were gathered from the observation of a large number of cases, not all successful cases, but when unsuccessful, the failure could generally be traced to some cause. A good many of them have been treated in the Royal Infirmary, and Chalmers Hospital, Edinburgh. The others were cases which were treated in various English Hospitals. A large number of them were under the charge of Dr. Patrick Heron Watson, whose exceeding surgical care and skill in the treatment I would beg respectfully to remember.

So far, it seems there are two objects to be kept in view, as guides to success in the antiseptic treatment of wounds,

1st. To prevent putrefaction.

2nd. To abstain, as much as possible, from applying any irritant to an open surface.

So long as we maintain these two conditions, a certain train of phenomena occurs which entirely differs from that which follows when putrefaction or irritation has been set up.

If the wound goes wrong, then there must be some cause for this, and it is only by diligent research and minute observation that we can hope to discover the cause, and institute the remedy. The prevailing tendency of modern observation on the subject of putrefaction seems to be more and more towards the germ theory of its origin; and certainly, in practice, every fact seems to point to this as by far the most probable cause; so much so, that it is almost impossible for a surgeon to conduct an antiseptic system of surgery without having the germ theory constantly before his eyes. Carbolic acid is by far the most serviceable antiseptic, on account of its great power and its volatility. It is, however, a powerful irritant, and should never come in contact with an open surface in a strong solution, or otherwise. We ought rather to insure that no atmospheric air comes in contact with the part which has not previously passed through a medium of the antiseptic. In fact, our object should be to place the wound in similar conditions to one inflicted subcutaneously.

The signs of a wound being kept antiseptically, are very well marked, and are the following:—

a. There is no putrefactive odour, and acetate of lead test paper is not blackened by the discharge.

b. The edges have no inflammatory blush, and are of their natural colour and dimensions.

c. Little or no discharge.

d. Pulse and temperature are normal, and there is no inflammatory pain.

e. Parts generally glued together, on the third day, with thickened lymph.

When a wound putrefies, it will generally be found that the putrefaction commences in the serous discharge which has soaked through the dressing during the first twenty-four hours, and that this putrefaction afterwards spreads to the wound itself. When putrefaction has once taken place in a wound, carbolic acid will never restore it to the state in which it would have been had it not putrefied; and, if used in strong solution to destroy putrefactive odour, it is a most dangerous application. Several reports have lately been published, giving accounts of mysterious cases of what was said to be tetanus following in a few hours after the application of pure carbolic acid to an open surface. There is little doubt that the great majority of these cases were instances of carbolic acid poisoning from absorption. Having seen some very suspicious cases of this kind, in which the patient died, or became seriously ill, in a short time after its application, I was led to make some experiments on the subject, and found that from five to ten grains of carbolic acid, injected subcutaneously, or put into an incision in the skin of a large rabbit or cat, were sufficient to kill them in from one and a half to two hours. The animals were first affected, in about five minutes after the application, with slight spasms in the limbs, which became excessive in about half a hour; and, finally, they died in a state of coma. I have seen patients affected in exactly the same way, after its use for too long a time, or in too concentrated a form. If the urine of such a patient be examined, it is smoky *when passed;* and, on standing for three days, became perfectly *black.* It contains carbolic acid, and the smoky appearance is not due to the presence of blood. A convenient test for carbolic acid in solution is the following:—Add a few drops of a solution of a persalt of iron, and a mauve colour is produced, which is soluble on the addition of nitric acid. The colour is best seen, when in small quantity, by placing the glass vessel on a piece of white paper, and looking at it from above downwards. It is a very delicate test, giving an indication with one part of carbolic acid in two thousand four hundred of water. I have obtained this reaction in the urine of a patient suffering from carbolic acid poisoning, caused by absorption from a wound.

In order to prevent the putrefaction of the serous discharge during the first three days after the operation of injury, several means have been adopted; carbolised cotton and carbolised muslin have been used, and these serve the purpose to a certain extent. Still in the case of carbolised cotton, bagging of the discharge is apt to occur at one part, and so tax the powers of the antiseptic too much at this particular part, making the risk of putrefaction greater than it would be were the discharge more equally distributed through a large space. What is far superior to these is "tenax," or fine picked oakum; the former is preferable, and it is of uniform strength. In order to act as an antiseptic, it must be put on in *a thick pad* all round the part, instead of the usual thin layer used for dressing purposes. This has the advantage over carbolised cotton, of allowing the discharge to soak slowly, and prevents bagging at any one part. At the same time it is, to a certain extent, waterproof, and does not allow the discharge to soak through too quickly. Its antiseptic powers are also quite sufficient to prevent putrefaction for twenty-four hours; and the volatile constituents are prevented from being dissipated too soon by the resins of the tar it contains, which offer a certain amount of resistance to evaporation, in the same way as the solid paraffin does in Mr. Lund's carbolised gauze. It is also very cheap, so that the objection to antiseptic surgery being an expensive mode of treatment, does not hold good in this instance. There is a certain objection to using it, for some parts, on account of its bulk, and to avoid this, "antiseptic calico" will be found to be very useful. It is made in the following way: One ounce of wood tar is dissolved in eight ounces of methylated spirit; this thin solution is then *brushed* over thin calico or muslin, previously cleansed from any flour or starch which they contain. The best calico for the purpose is what is known as "jaconet," and the muslin should not be too open, and must be soft in fibre. After the calico or muslin has been coated over in this manner, it is pressed with a weight, of from thirty to forty pounds, so as to drive out any superabundant spirit, and thoroughly to saturate the texture in every part. It is then hung up to dry in a current of dry air, and not exposed to the direct rays of the sun. It is now ready for use, and in this state ought not to soil the fingers, and should be perfectly soft and pliable. When this "antiseptic calico" is employed as an external dressing, it ought to be wrapped round the part in several layers. Supposing the case to be one of amputation, the following rules have seemed to me to be important guides to success.

Make certain that the instruments, lotion pots, sponges, &c., contain no organic matter. This is most important, and neglect of this is a common cause of failure. The sponges ought either to be quite new, or ought to be cleansed by first putting them into a weak solution of ammonia, then in a weak solution of nitric acid, and lastly, in a solution of carbolic acid. As an additional precaution, they should be put in a solution of permanganate of potash, as a test for organic matter. They ought not to be entrusted to nurses and *never* to be used again, if, by any means, they have come in contact with purulent or putrefactive discharge. Wash the limb or other part with a solution of carbolic acid in water, before operation, and shave away any hair from the neighbourhood. Use the carbolic acid spray apparatus during the operation; the strength of the solution employed being 1 to 100. See that nothing in the shape of cotton fibre, or organic texture of any kind, unless rendered antiseptic, comes near the wound during operation. Use carbolized catgut ligatures and silver wire sutures, the one soaked in carbolic oil, the other dipped in carbolic lotion, and see that no organic matter adheres to the needle or wire. Stitch the wound up *closely*, leaving an opening at the most dependent part, large enough to admit the nozzle of a syringe. Cover the wound with a strip of xylonite tissue, soaked in carbolic lotion. This xylonite tissue contains a certain amount of camphor, which, along with the small amount of carbolic acid contained in the solution, renders it quite antiseptic. It acts as an excellent "protective covering," is quite waterproof, and exceedingly cheap. As long as there is much serous oozing, that is to say, during the first three days, the "carbolic lac plaster" does no harm. It is when it is kept on for a longer period that it causes irritation, and retards the healing of the wound, and should be given over in favour of a milder preparation. So long as it does not come actually in contact with the open surface, there is no harm done for three or four days, and, in a great many cases, an antiseptic of this strength is absolutely necessary during this time. After the serous oozing has ceased, then the greatest danger of putrefaction setting in is over, and there is no necessity for such a strong preparation as the carbolic lac.

Having put on a piece of the carbolic lac plaster, overlapping the wound for three or four inches, we next wrap round it something to soak up the bloody serum likely to escape from under the plaster. For this purpose carbolic gauze may be used in several layers; but what I have found better is a pad of tenax, put all round the limb in *large* quantity, and especially at the most dependent part. Or, if this cannot be conveniently applied, antiseptic calico may be substituted, always taking care that it be in large quantity. I have not found the practice of putting a piece of waterproof tissue between the outer layers to be attended with good results. It keeps the part damp, and hence furnishes one of the elements for the putrefactive process. It is much better to employ some bulky substance, such as tenax, which is to a certain extent waterproof, but allows the vapour to escape through its substance. At the same time, it acts as a compressing agent, and prevents blood oozing in too great quantity. Put a tight bandage round the part, and this bandage ought in certain cases to be made of antiseptic calico.

How often should the dressing be changed?

If there is much serous oozing, change the dressing every twelve hours, or oftener; if there is not, leave it for twenty-four hours, but not longer. In changing the dressings, use the greatest caution. Never expose the wound unless under a spray or veil of carbolic acid solution. If there is much clotted blood in the wound, wash it out by syringing with carbolic lotion (1 to 100). If there is not much clot, do not disturb it, but simply readjust the dressings, after the surrounding parts are carefully cleansed and dried. Touch the parts as little with the fingers as possible. Dress it again in twelve hours if necessary. Be guided in this by the amount of oozing. Having arrived at the third day, if the wound has been kept antiseptic, what we expect to find is the following:—There is no swelling, redness, or tension on the sutures; the edges are in intimate contact, and covered with thickened lymph; there is no pain on moderate pressure. The discharge, if any, is of a lymphy character, and contains a large quantity of desquamated epithelium in a softened condition. It generally contains abundance of germinal matter when of a lymphy character.

Now is the time for leaving off any strong preparation of carbolic acid, and applying a much weaker antiseptic, and one as little irritating as possible. For this purpose, antiseptic calico or tenax suit admirably, the wound being protected as before with a strip of xylonite tissue. They must be applied in large quantity, and so to entirely surround the part. In a day or two the part contracts, and heals without any appearance of inflammation.

In compound fracture, the wound should be thoroughly washed out with a solution of carbolic acid, of the strength of 1 to 40. A piece of xylonite, or green protective tissue, cut a little larger than the wound, should then be soaked in the same lotion and placed over the wound. The limb should then be wrapped round with carbolic lac plaster, overlapping the wound for about two inches, and, over this, strips of antiseptic calico should be placed in several layers. A strong brass syringe should be used for washing out the wound, and a solution should be made forcibly to penetrate to every part, and to "float" out any foreign bodies which may have accidentally been admitted. The limb should then be laid on a splint, made, as far as practicable, of metal, and padded with tenax. The dressings ought to be changed in twenty-four hours, if there is any oozing, or before this if necessary. If there has been any oozing into the padding of the splint, this should also be removed. In changing the dressings use the spray apparatus, or a veil of washed linen soaked in a solution of carbolic acid (1 to 100). Wash the wound and surrounding parts carefully with carbolic acid solution of this strength, and then, while the wound is covered with the veil, thoroughly *dry* the surrounding parts. Dress as before. On the following day there will probably be little or no oozing, and now it is only necessary to dress it with a protective covering, and several layers of antiseptic calico or tenax. In instances where the injury is severe, and the wound large, it is necessary to continue the carbolic lac plaster for a longer time, as the danger of putrefaction is, of course, greater in that case. The greatest care must be taken in changing the dressings, to avoid having the wound exposed at any time, except under the carbolic acid spray, or covered with a veil. In treating scalp wounds and compound fracture of the skull, the hair should be closely shaved round the wound. Then the wound should be washed out carefully with the solution (1 to 40) of carbolic acid, so as to remove every vestige of foreign matter. The edges are then to be drawn into *intimate* contact with wire sutures. Over this a strip of protective tissue is placed, and finally, a large pad of tenax, without any carbolic lac plaster, and this is fixed with a tight bandage. The dressing is to be changed on the following day, and the wound dressed in the same way. On the third day the wound will be a superficial scar, and can be dressed with tenax, without any protective covering, so as to form a scab. Scalp wounds, when treated properly in this way, *never* suppurate.

In treating granulating superficial wounds, the same principles hold good, only we must be especially careful never to allow carbolic acid, in strong solution, to come in contact with the wound. If we do so, the wound never heals, the carbolic acid seeming to act on the protoplasmic germinal centres, and to destroy their tissue-forming powers. If the ulcer is not irritated with carbolic acid, it will heal rapidly, provided putrefaction is prevented, and that there is sufficient tissue left to form a cicatrix. It ought to be washed with a solution of carbolic acid (1 to 100), then covered over with a piece of protective tissue, of the size of the wound. It should next be covered with several layers of antiseptic calico; and if there is much discharge, a large pad of tenax should be placed at the most dependent part. This dressing ought to be changed every twelve hours if there is much discharge, or every twenty-four hours if this is moderate; all the precautions which were recommended in changing the dressing of a compound fracture, being used in exactly the same manner in this case.

As regards the occurrence of pyæmia or erysipelas, I have never known a case of either the one or the other occur where the wound has been treated antiseptically; in fact, taking the general run of cases in hospital, in the same wards, and under the same circumstances, the only examples of pyæmia, erysipelas, or diffuse suppuration I have seen, during the last three years, have been in patients who were not treated on antiseptic principles.—*Liverpool and Manchester Medical and Surgical Reports*, 1873, *p.* 140.

85.—ILLUSTRATIONS OF THE SURGICAL USES OF THE PNEUMATIC ASPIRATOR.

By T. R. Jessop, Esq., Surgeon to the Leeds General Infirmary, and Lecturer on Surgery at the Leeds School of Medicine.

[Medical practitioners in general are not fully alive to the great disadvantages which they labour under from the want of a thorough appreciation of the many and varied purposes which the aspirator has been found to fulfil. The instrument was invented by Dr. Georges Dieulafoy. Having repeatedly observed how unimportant a lesion is produced by the insertion of the fine nozzle of the hypodermic syringe, and also the impunity attending the introduction of acupuncture needles, even deeply, into the substance of important and highly organised structures, he conceived the idea of creating a vacuum in connexion with a fine tubular needle, so as to exercise a powerful suction upon any fluid into which the needle should be introduced. This principle he embodied in his instrument, the pneumatic aspirator.]

As is the case with all inventions, many improvements have been made upon the original instrument. The one which I now show you is the latest issued by Messrs. Weiss and Son, of the Strand, London; and, in my judgment, it possesses decided advantages over all others which I have seen. It consists of a brass syringe, capable of holding five ounces of fluid, fitted with an air-tight screw-piston, and having its nozzle guarded by a tap. Attaching the nozzle to the bottom of the syringe is a short tube of glass, which enables the surgeon to ascertain the quality of the fluid as it passes into the body of the instrument. To one side of the instrument, in its whole length, is applied a fine hollow glass tube, which communicates at its lower extremity with the interior of the syringe, and is shut off from the external atmosphere, at its upper end, by means of a tap. The glass tube is marked at regular intervals in half-ounces, for the purpose of demonstrating the quantity of fluid contained in the syringe at any given time; and forms, besides, a means of exit, whereby the syringe can be emptied of its contents when, during an operation, it is desirable not to disengage the nozzle. Several tubular needles and trocars, some of which are of extremely fine calibre, made accurately to fit the nozzle of the syringe, either directly or through the medium of an elastic tube, complete the instrument.

In describing how to work the aspirator, I cannot do better than make use of Dr. Dieulafoy's own words, altered only so as to apply to the improved instrument. He says: "In order to produce a vacuum within the pump, it is necessary first to close the two taps, and then to screw up the piston. The vacuum is thus obtained as a preliminary measure, and the operator is in possession of a powerful aspirator, ready to be used when the proper time arrives." "Let it be supposed that we wish to examine an effusion into the cavity of the pleura. The tubular needle No. 1 or No. 2 must first be introduced into an intercostal space; and when it has penetrated the tissues for about a third of an inch, it must be connected with the pump in which the vacuum has been established, either directly or through the medium of a caoutchouc tube. This done—and to this point I desire to call special attention—the tap must be opened between the needle and the vacuum, and the needle pushed gently forward. We may thus slowly traverse the tissues, so to speak, with the vacuum in hand, until we discover the effusion. The eye of the operator should be directed to the short glass tube between the needle and the pump; and, at the moment when the needle enters the liquid, the latter rushes forcibly into the instrument. The diagnosis is at once complete, the manœuvre is absolutely harmless, and the desired object is attained."

Such is the measure of employing the aspirator which I have myself usually adopted : and the directions here given apply to all cases, medical and surgical, in which its use is indicated, equally with the example selected by Dr. Dieulafoy for his description. As a precaution against the introduction of septic materials, I always take care that the needle or trocar has been dipped overhead in carbolised oil. I have said that in the aspirator we possess a valuable aid both to diagnosis and to treatment. I will now go on to make a few selections from the numerous cases in which I have resorted to its employment.

And first, I will speak of its use for purposes of diagnosis. There are few groups of diseases which present greater difficulties, or which tax the skill of the surgeon in a higher degree, than *abdominal tumours*. Not many of us can look back upon our experiences without calling to mind numerous instances in which grave mistakes have been made, leading to pernicious treatment, and destroying the confidence of our patients both in ourselves and in our science. That in the aspirator we possess a powerful means of elucidating some at least of these cases, is sufficiently shown by the following examples.

Case 1.—On August 30th last, a woman, aged 46, was admitted under my care into the Leeds General Infirmary with an abdominal tumour of twelve months' growth, and equal in size to a seven months' pregnancy. The tumour was somewhat fixed towards the pelvis; several hard movable nodules could be distinguished through the abdominal walls; it was doubtful whether fluctuation existed or not. The pelvis was found, on vaginal examination, to be filled posteriorly by a firm mass, and the os uteri could not be felt, being apparently pushed above the pubes, high out of reach of the finger. Menstruation had for some years been very irregular. My colleagues examined the case with me, and we all felt doubtful as to its nature. On September 21st, aspiration was made through the abdominal walls with the result of extracting four ounces of a thick glutinous brown-coloured fluid, such as is found only in ovarian cysts. The nature of the disease having been thus established beyond doubt, a fortnight later I performed upon her the operation of ovariotomy.

Case 2.—One day last week it was intimated to me that Dr. Allbutt wished me, as his surgical colleague, to examine a patient in his ward, a married woman, aged 34, with a view to decide upon the propriety of recommending the operation of ovariotomy. The enlargement was first suspected early this year, and was attributed for some months to natural causes. I found the abdomen distended to about the size of a full pregnancy, by a round, centrally placed, smooth tumour, in which a not very distinct fluctuation could be felt. On vaginal examination the os uteri was felt high up posteriorly, small, and round; the cervix had disappeared; no movement of the os could be detected by displacing the tumour from side to side; and a Simpson's sound introduced into the uterus showed the cavity of that organ to measure an inch and three-quarters only in depth. The central position, the shape, and the general character of the tumour, the absence of cervix uteri, the duration of the symptoms, taken together, were sufficient to throw a little doubt upon the true nature of the case. On appealing to the aspirator, however, the ovarian character of the tumour and the correctness of Dr. Allbutt's diagnosis, were at once determined, by the extraction of a syringe-full of thick stringy gelatinous fluid.

Case 3.—In July of this year, I was asked by Mr. Booth, of Mirfield, to see, with him, an elderly female, the right half of whose abdomen was filled with a prominent mass, the origin of which she attributed to her daughter having accidentally trodden upon her in getting out of bed a few months before. The increase in size had been gradual, and had been attended by considerable pain and some febrile disturbance. On percussion, the tumour was dull, and on handling, an indistinct fluctuation was made out. A few days afterwards, I withdrew by means of the aspirator several ounces of pus, and was thus enabled confidently to pronounce the case one of cellular abscess, and to confirm the patient's own opinion as to the origin of the disease.

Case 4.—Not many months ago, a man, aged about 40, of weak intellect, and therefore unable to give any reliable history of himself, was sent from Tadcaster and admitted into the Leeds Infirmary under Mr. S. Hey, with complete retention of urine, and his bladder distended so as to reach above the umbilicus. Our resident medical officer, Mr. M'Gill, at once passed a No. 8 silver catheter, and drew off forty ounces of fetid urine—as much as would flow. And yet the distension was not wholly removed; above the pubes, a round fluctuating swelling remained, which, from the rectum, was found to communicate with a soft elastic bulging there distinctly felt. The aspirator was applied from the rectum, and by it twenty-five ounces of fluid were quickly pumped out, whereupon all tumour was found to have disappeared. The fluid was clear, had a specific gravity of 1004, and, besides large quantities of common salt, contained numerous hooklets and undamaged echinococci. The retention ceased, but the patient died a week afterwards from the inflammatory changes induced by the long continuance of the obstruction. At the *post mortem* examination, the hydatid disease was thought to have occupied the prostate itself, and similar disease was found both in the liver and omentum.

I will finish my illustrations of the diagnostic value of the aspirator by briefly relating a very important and not less interesting case which occurred recently in the hospital practice of my colleague, Mr. Wheelhouse, and which I had the opportunity of seeing in consultation with that gentleman.

Case 5.—J. M., aged 30, a striker by occupation, had been the subject of a right inguinal hernia for four months, and had never worn a truss. The bowel had frequently from time to time descended, and had always been returned without difficulty. About breakfast-time, on October 2nd, 1872, whilst he was at work, the hernia suddenly protruded with pain. Finding himself unable to reduce it as usual, he went home. Symptoms of strangulation soon supervened, and his sufferings became greatly increased. It was not, however, until the evening of the 4th that he sent for his medical attendant, who ordered his immediate removal to the infirmary. When seen on admission, he was vomiting frequently; his abdomen was highly distended, tympanitic, and tender on pressure; his countenance betrayed anxiety, and his pulse was small and thready. The right inguinal region was occupied by a swelling of the size of a hen's egg, not very tense, but upon which taxis produced not the least impression. Opium was administered, and taxis again failed. He was then placed under the influence of chloroform, and an attempt was once more made to reduce the rupture, but in vain. The finest of the needles of the aspirato was now introduced and attached to the syringe, whereupon two ounces of bloody serum were removed, and the swelling vanished altogether. The finger could now be passed without obstruction through the inguinal canal as far as the internal ring. Under these circumstances it was decided to postpone any further proceedings untill the following morning. Vomiting occurred at intervals during the night; but at the morning visit, the patient stated that the rupture had again descended, and that he had been able to reduce it himself. It was not until the morning of the 6th that all vomiting ceased; but from the first there was a gradual and steady amelioration of his symptoms, and, finally, he has made a perfect recovery.

It is by no means an easy matter to state, with any degree of certainty, the actual order of events in this most fortunate case. It may be safely concluded, however, that the use of the aspirator precluded the necessity of following that good old rule—"when in doubt, operate."

I will now go on to mention a few instances in which aspiration has been resorted to as a means of treatment. Two of the earliest occasions upon which I made use of the instrument were in cases of advanced chronic hydrocephalus.

Case 6.—In the first, a child, fifteen months old, I removed on May 18th, 1871, by means of the finest needle passed through the anterior fontanelle, six ounces of fluid; and on the 22nd, twelve ounces. The child died on the 23rd in convulsions.

Case 7.—The second child was only three months old when first brought under notice. On July 22nd, 1871, I removed five ounces of fluid; on the 25th, three ounces; on August 1st, an ounce and a half; and subsequently, on seven occasions, at intervals of a few days, one ounce of fluid was removed. This case terminated fatally, also by convulsions, on September 13th.

A careful *post mortem* examination was made in each of the two instances, with the special view of discovering the immediate effects of the introduction of the needle, but no trace whatever could be detected either in the membranes or in the brain-substance.

Soon after I became familiar with the aspirator, it occurred to me that it was not unlikely to prove useful as an aid, under certain circumstances, to the reduction of strangulated hernia. I thought that, if the sac, for instance, contained a large amount of fluid, the withdrawal of the fluid might enable the surgeon to apply his reducing force more directly, and, therefore, more efficiently, upon the solid constituents of the hernia. And, again, if the strangled intestine were emptied of its fluid and gaseous contents, its reduction by taxis might be facilitated. In five examples of this affection, all presenting conditions apparently favourable to the proceeding, and in all of which taxis under chloroform first proved insufficient, I have practised the use of the aspirator, in the full hope of being able to avoid the major operation; but, hitherto, my efforts have not met with success. In all the five, herniotomy was finally resorted to; and it is interesting to observe that, in none was there any sign to show where the needle had penetrated. Cases have lately been referred to in the journals in which success has been achieved by operators abroad. I am still hoping that a further trial may lead to more satisfactory results in my own hands.

Some few months ago, several gentlemen showed great anxiety to obtain the credit for themselves, or for their friends, of having been the first to tap the intestines in cases of great flatulent distension. I remember the late Mr. Teale, in 1860, whilst introducing an acupuncture-needle twenty or thirty times through the abdominal walls in a case of excessive tympany following herniotomy, remarking to the students around him that, in his early days, he had been accustomed, under similar circumstances, to use the trocar after the manner of veterinary surgeons; but, that, of late years, he had preferred the acupuncture-needle, as being at the same time less dangerous and equally efficient. Calling to mind this advice, I employed the aspirator on several occasions in May 1871, to the great relief of an elderly man, whose leg I had amputated by the supracondyloid method, and who in his last two or three weeks suffered in an unusual degree from excessive flatulent distension. On *post mortem* examination, a few red points, on both the parietal and visceral peritoneum, were thought to indicate the spots at which the needle had entered.

The instances are now numerous in which I have employed the aspirator, with decided advantage, in the emptying of chronic abscess. I will content myself with relating one example, by no means a solitary one of its kind.

Case 8.—In May 1871, I was consulted by Mr. T., aged 40, who for nearly six years had been suffering from excessive pain in the lumbar and lower dorsal spine, and at the top of whose right thigh a swelling had for nine months been gradually increasing. The case, as it presented itself to me, was, in short, one of marked angular curvature at the junction of the dorsal and lumbar vertebræ, accompanied with a psoas abscess, which, when he stood erect, was about as large as an orange. On June 10th, I removed seven ounces and a half of pus by aspiration, draining the abscess as completely as possible. In a few days fluctuation returned, and the swelling gradually increased. On June 28th, the aspirator was again applied, and three ounces and a half of pus removed. From this time the abscess may be said to have been cured; for although, on February 7th this year, I was induced once again to introduce the needle, from a feeling of suspicion that matter had reformed, I was unable to procure a single drop. At the present time no difference whatever can be detected between the two sides, and he is quite free from all pain. The curve, of course, still remains; and, as a matter of precaution, I am continuing to enjoin a large amount of rest in the recumbent position, and an entire freedom at other times from such movements as would be likely to affect injuriously a spine which has undoubtedly been extensively diseased.

There are few conditions which more frequently call for the attention of the surgeon than the various forms of joint-effusion; and whilst some of these are of a transient character, or readily yield to appropriate treatment, there are others, the nature of which it is to be obstinately persistent; or, again, in which the effusion is but the precursor, if not indeed a chief factor, in the production of those processes which, if constructive in their tendency, end in ankylosis; but, if destructive, lead only to excision, amputation, or death.

It is within my own recollection—nay, I believe the practice still lingers in the dark corners of our profession—that surgeons were in the habit of spending month after month—aye, and in some instances, year after year—in leeching, blistering, burning, compressing, mercurialising, and drugging their patients, with the sole object of procuring absorption by a membrane, which, it may be, had ceased to be capable of absorbing, and which, at all events, obstinately refused to take the desired turn; or perhaps, goaded by the constant irritation from without, openly rebelled, as it were, in the form of suppuration and destruction.

Whilst no means were too severe to be applied to the exterior, it was a cardinal doctrine that to interfere with the interior of a joint—except in cases of acute suppuration—was an unsurgical and unwarrantable proceeding. The sacred character of synovial membranes, like many other phantoms, has vanished before advancing science. Dropsical joints are now treated by tapping, just as are the peritoneum, the pleura, or the pericardium. A couple of years ago I published in our Journal the history of a series of knee-joints, which I had successfully treated, when in an early condition of inflammation, by *free incision*, made under the protection of an antiseptic spray. And now that we possess the aspirator, we shall hardly be disposed, I imagine, to consume as many days as we formerly did months, in the endeavour to disperse a fluid, whose presence is not seldom the sum total of disease.

The following are selected from a considerable number of cases which have been similarly treated:—

Case 9.—A gentleman aged 21, in falling from his bicycle, struck his left knee a violent blow against the corner of a wall. Faint, and in great pain, he limped, as best he could, to his home, where I saw him on the following day, June 8th this year. The joint was distendd from effusion within. He suffered but little, and could bear manipulation well. Rest in bed, an evaporating lotion, and an occasional purgative were prescribed. This treatment was duly persevered in for a month, without producing any perceptible change in the condition of the joint.

On July 5th I applied the aspirator, making use of the smallest trocar, and drew off seven ounces of fluid, which consisted of little else than blood. It was the first time I had met with blood in a joint under similar circumstances, and I felt somewhat anxious as to the result. The knee, although emptied of fluid, looked decidedly thicker than the sound one, but was neither painful nor tender. The limb was placed upon a straight splint, and the evaporating lotion was continued. There was no return of fluid, and, indeed, nothing of an untoward nature at any time arose. On August 6th he was allowed to get up, with the joint supported by a plaster of Paris bandage. In six weeks the bandage was removed; and at the end of September he could walk well—a little stiffness and a slight thickening of the joint alone remaining.

The following is a somewhat similar case:—

Case 10.—F. M., aged 40, a dyer by occupation, was admitted into the Leeds Infirmary on September 16th, 1872. On August 31st, whilst attempting to climb over a high wall, he fell upon his left knee. Although in very great pain, he walked home—a distance of about two hundred yards—and on arriving there he found that his knee was much swollen. Nevertheless, for three days he continued at his work, and only then desisted because of extreme suffering. After a few days' rest the pain ceased, but the swelling remained as before. Lotions and poultices were applied, and during two days the joint was painted with tincture of iodine. On admission, there was decided, though not excessive, swelling of the knee, and fluctuation was distinct. On September 18th, by means of the aspirator, I withdrew three ounces of a fluid deeply tinged with blood. The limb was placed upon a straight splint until September 28th, when a plaster of Paris bandage was substituted, and he was made an out-patient. On October 14th the bandage was removed at his urgent request, and, as recovery was apparently complete, he was permitted to return to his employment.

Satisfactory as were the results in the two cases just related, I think I am justified in attaching more importance to the two following; for, if my belief in the pyæmic origin of each be well founded, it would hardly be possible to exaggerate the value of a means whereby an issue so successful was accomplished.

Case 11.—Joseph J., aged 21, a coal-miner, was admitted into the Leeds General Infirmary on September 19th, 1871, on account of acute periostitis with suppuration affecting the right humerus, of four months' duration. Incisions were made for the evacuation of pus. On October 14th, after several chills, not amounting to actual rigors, followed by feverish symptoms, and a rapid rise of temperature, he complained of great pain in the left hip-joint, which was intensified on the slightest movement. The application of the long splint afforded some relief; but the surgical fever continued without abatement, and the uniformly great difference between the morning and evening temperatures indicated the presence of acute suppuration. On October 27th the left knee became suddenly swollen and acutely painful. On November 1st this joint was aspirated, and two ounces of a clear fluid withdrawn—an operation, so far as that particular joint was concerned, which gave immediate and permanent relief. The general condition of the patient, however, was unimproved; and, as the affected hip continued still the source of sleepless nights and weary days, the aspirator was applied to this joint also on December 10th, with the result of extracting nine drachms of thick pus. The operation acted like a charm; his suffering was at once removed, and soon the balance of healthy action returned. On January 12th, 1872, he was discharged able to walk well, and with free movement in both hip and knee.

Case 12.—The second case may be related in few words. A man, aged 52, was in the Leeds Infirmary suffering from old stricture of the urethra with many perineal fistulæ. I had admitted him for the purpose of his undergoing the operation of perineal section. When he had been in the ward a few days he was seized with rigors, which were followed by inflammatory fever, and pain with some swelling of the left knee-joint. On the day after his seizure, fluctuation being decided, I removed by the aspirator an ounce and a half of turbid synovia. The pain at once ceased; and a week afterwards he was sent home for awhile to recruit his health, lest an operation then performed should be followed by more serious consequences.

One case more and I have done. It was the second of four I have had of its kind, and is selected now chiefly on account of its brevity.

Case 13.—On December 26th, 1870, a man, aged 38, was admitted under my care into the Leeds Infirmary with his bladder fully distended, and totally unable to pass a drop of urine. The retention had lasted for fifty-four hours, and several efforts had been fruitlessly made to enter his bladder. On my visit he had already been placed by our resident medical officer in a hot bath, and opium had been freely given. A gentle attempt at catheterism sufficed to demonstrate a closure of the urethra a little beyond the bulb, and was followed only by the escape of a few drops of blood. Without further delay I plunged the finest needle of the aspirator straight through the abdominal walls into the bladder, and, attaching the syringe, drew off thirty-eight ounces of urine. In about six hours dribbling by the natural passage began, and, after a few days, I was able to commence the treatment of his stricture under circumstances not less favourable than if retention had never occurred.—*British Med. Journal, Dec.* 7, 1872, *p.* 625.

36.—ON EXPLORING AND TAPPING.

By Dr. William Roberts, Physician to the Manchester Infirmary.

Exploring by Tubular Needle and Syringe.—This method far excels the grooved needle, or small trochar and canula. The instrument resembles the apparatus used for subcutaneous injection. It consists of a tubular needle and a syringe.

The needle is about the thickness of a medium sized toilet-pin, an inch and a half long, finely pointed and made of gold. It is mounted at the hilt with a cross-bar and a screw. The syringe is composed of glass, mounted in German silver, with a metal piston, and made to contain about twenty minims. The hilt of the needle screws into the nozzle of the syringe.

In exploring a doubtful tumour, or a suspected collection of fluid, the needle is screwed on the syringe and the piston driven home. It then forms a compact and easily-handled instrument. The skin is first tightened over the part to be explored, and the needle thrust in. The piston is then drawn up.

If there be pus or any other kind of liquid, the syringe is immediately filled therewith, and the instrument may be withdrawn. If the substance be solid, only a few particles of blood come up; the syringe should then be unscrewed, leaving the needle *in situ*—and, the piston being driven home again, the syringe should be re-screwed to the needle and the piston drawn up a second time, with a sharp action, so as to exercise the maximum of suction power. By this manœuvre small particles of even a solid tumour can be sucked up into the needle or into the syringe; and, if the tumour be a soft solid, like an encephaloid growth, a grain or two of the material can be obtained for examination.

After the needle is withdrawn the puncture should be pressed firmly with the finger for about a minute, so as to permit the wound in the track of the needle to contract, and in this way to prevent the risk of extravasation.

The advantages of this method of exploring are:

1. A fine round instrument makes a minute *punctured*, and not an *incised* wound through the tissue, so that it can be driven safely and without anxiety into almost any part.

2. An available quantity of material is obtained for examination, either by the microscope or by chemical tests, unmixed with fragments of the tissues through which the needle has penetrated. By thrusting down the piston (after the instrument is withdrawn) the contents of the syringe or any minute particles sucked up into the hollow needle, can be discharged on a microscope slide, or into a test-tube, as the case may be, and subjected at once to examination.

3. If the explored part be found to contain a collection of pus, or of any other fluid, it may, if it be thought desirable, be at once evacuated—either by removing repeated syringefuls if the collection be a small one, or, if it be large, by attaching to the needle an india-rubber tube previously filled with water, as will be more fully described in the next section.

Of the safety and convenience of this mode of exploring I can speak with confidence, after a large experience of several years, both in the wards of the infirmary and in private practice.

I have thus explored suspected tumours, cysts, and abscesses in almost all parts of the body. I have explored the chest repeatedly, in pleuritic effusion, and once in a case of solid (malignant) infiltration of the lung—the peritoneal cavity, and various abdominal tumours and cysts, more times than I can remember—the liver, in malignant disease of the organ, seven times—four times in cirrhotic induration—twice in albuminoid or waxy enlargement—five times in hydatid cysts of that organ—the spleen twice in chronic tumours—the kidneys four times in malignant disease, and once in pyonephrosis—and a large aneurism of the abdominal aorta on three successive occasions. In none of these cases did the smallest ill effect arise.

Tapping by Tubular Needle and Syphon-arrangement.—In the previous section of this paper I have explained how small abscesses and cysts can be evacuated with the tubular needle and syringe, by the removal of one or more syringefuls. In the hands of some of my medical friends this has been found a useful method in small abscesses of the neck, when it is important to avoid unsightly scars. The wound made is so small that it can be perfectly sealed up by a drop of plastic collodion, and the operation may be repeated once or more, without risk of admission of air, until the abscess dries up. The principal drawback to this method is, that if the pus be flaky, the flakes plug up the bore of the needle and interrupt the operation. A slight obstruction of this sort may be dislodged by a thrusting movement of the piston; but if the flakes be large, they become impacted in the needle and put a stop to further progress.

When the collection is larger, and the fluid to be removed is serous or watery, a better arrangement is to attach an india-rubber tube, previously filled with water, to the hilt of the needle.

The needle employed is the same as that used for exploring, described in the preceding section. For reaching deep-seated collections, I employ a second, somewhat thicker needle (as thick as a stout toilet-pin), three inches long. The india-rubber tubing is three and a half feet in length, and of the thickness of that employed for infants' feeding-bottles. One end is mounted with a small screw fitting on to the screw on the hilt of the needle, the other end is furnished with a small stop-cock.

The object of this arrangement is to employ syphon-power as a soliciting force: for the bore of these needles is so small that liquids will not flow through them except with the aid of either a propelling or a soliciting force. When the apparatus is in operation, the needle corresponds with the short leg of the syphon, and the elastic tube with the long leg of the syphon; the excess of weight of the column of liquid in the long leg over that in the short leg represents the amount of soliciting force operating at the point of the tubular needle.

In tapping by this method the tubular needle may, in the first instance, be attached to the syringe and thrust into the cavity to be tapped, as in the process of exploring. The existence of fluid having thus been ascertained, the syringe is unscrewed (the needle being left in), and the india-rubber tube (previously filled with water) screwed on in its place. The lower end of the elastic tube is then placed in a receiving vessel on the floor, and the stop-cock opened.

If the existence of fluid is known, or confidently reckoned on, the elastic tube may be screwed on to the needle at once. The tube is then filled with water and its stop-cock shut. The needle is then thrust into the cavity to be tapped, and the flow set a-going, by opening the stop-cock, in a vessel on the floor.

The previous filling of the elastic tube with water is, of course, absolutely necessary to the success of the proceeding. The simplest way of accomplishing this is to place the screw end of the tube in a jug or bowl of water, and to suck up the water through the opened stop-cock at the other end, until the tube is full If this proceeding is objected to on the score of cleanliness, the following plan may be adopted. The stop-cock being previously shut, the tube is rolled around it into a tight ball—this expels the air from it. The screw end is then submerged in a vessel of water on the table, and the ball is allowed to unwind itself towards the floor. The stop-cock is then opened, and the water soon begins to run. The stop-cock being again shut, the tube remains full of water, and may be brought to the bedside, ready to be screwed on the needle as soon as the latter is introduced into the cavity to be tapped.

This method of tapping is not applicable to abscesses or cysts with viscid contents, but is of service to evacuate serous and living hydatid cysts; it may also be used to evacuate peritoneal and pleuritic (? pericardial) effusions, or a distended bladder.

The rate of flow obtained by this method, as applied in clinical practice, is from two to three pints per hour. I find by experiment that the speed with which liquids pass through tubular needles, is affected by the bore of the needle, its length, and the available fall; that is, the vertical height of the cavity to be tapped (as the patient lies in bed) above the floor. Operating with the needles already described, and with an available fall of two to three feet, I have in practice obtained a flow of two-and-half to three-and-half pints per hour. Serous fluids, such as pleuritic and peritoneal effusions, and urine, flowed at the same rate as pure water—so did the contents of ovarian cysts when they were simply serous—but pus and viscid ovarian fluids flowed very slowly, or not at all.

This method may be applied to ascites or an ovarian cyst, when it is desirable to avoid the shock of a too rapid evacuation. I have in this way emptied accumulations of twenty and thirty pints. Such large collections take six or eight hours to run; but as the presence of the needle (which is secured *in situ* by strips of adhesive plaster over the cross-bar at the hilt) causes no pain, and the patients lie quietly in bed, and even take their meals while the operation is proceeding, this is no great inconvenience.

Tapping the Bladder by Needle and Syphon arrangement.—I have not yet had an opportunity of testing the utility of this method in actual practice; but a medical friend, whose name has unfortunately escaped my memory, informed me that he had used it with success. It seems to offer considerable advantages over the usual modes of proceeding. In the dead body, I have made repeated trials with the most satisfactory results. In children and thin persons the inch-and-half needle is sufficiently long; but in fat persons the three-inch needle should be used. I found it easy to pass the needle into the bladder immediately above the symphysis pubis without wounding the peritoneum. The puncture made by the needle is so minute that there could scarcely be any risk of extravasation of urine, even if the operation were required to be repeated a second time.

I would also suggest the use of this method for tapping hydrocephalic accumulations, and those of spina bifida.

Tapping by fine Canula and Syphon arrangement.—In removing large collections of fluid from the chest, abdomen, or an ovarian cyst, it is usually convenient to employ a somewhat larger instrument than the tubular needle.

After a trial of instruments of various forms and sizes, I have adopted, as the most generally useful, a straight silver canula, furnished with a stop-cock and screw. Two sizes are sufficient—one an inch-and-half long, and about the thickness of a hydrocele canula—the other two inches long, and about the thickness of a crow-quill. The smaller canula is used in all ordinary tappings of the chest and abdomen, and in evacuating ovarian cysts with diffluent contents. The larger one is used for large abscesses and other purulent collections, and for ovarian cysts with less diffluent contents. Each canula is fitted with a suitable trocar, and the elastic tube, mounted with a screw at one end and a stop-cock at the other, already described in the previous section, completes the apparatus.

The steps of the operation are similar to those in operating with the tubular needle. The elastic tube is first filled with water, and its stop-cock shut. The canula, armed with the trocar, is then thrust into the cavity to be tapped—no previous incision of the skin being necessary. The trocar is now withdrawn, and the stop-cock on the canula immediately shut. The elastic tube is then leisurely screwed on the canula, and the lower end placed in the receiving vessel on the floor. Finally both stop-cocks are opened, and the fluid is allowed to run. I should mention that the elastic tube is furnished, near its upper end, with a short length (about two inches) of glass tubing to serve as a window, to enable the operator to watch the proceeding. The rate of flow obtained by this arrangement, and using the smaller canula, varies from eighteen to thirty pints per hour. After the flow has ceased, the canula is withdrawn, and the small puncture is sealed with plastic collodion, or a piece of adhesive plaster.

The advantages offered by this method over the ordinary proceeding with simple trocar and canula are the following. A much smaller instrument can be employed—the evacuation proceeds equably and gradually—there is no necessity for any flannel bandages around the abdomen—the patient lies quietly in bed while the operation is proceeding—it is perfectly neat and cleanly—and in the case of cysts their contents can be emptied more completely. In thoracentesis no air can enter the chest so long as the lower end of the tube is kept submerged in the fluid contained in the receiving vessel.

I should mention that towards the end of the operation little bubbles of air are often seen passing down, or up and down, the little piece of glass-tube which serves as a window to watch the proceeding. This appearance is not due to any air passing from or into the cavity which is being tapped, but to the difficulty of obtaining perfectly air-tight joints in the apparatus. As the supply of fluid from the tapped cavity falls short, the soliciting force of the syphon begins to act on the joints of the stop-cock, and if these be not air-tight, draws in small bubbles of air into the elastic tube. This does not, however, practically interfere with the complete success of the operation. Nevertheless in thoracentesis it is well to guard against the aspiratory action of the chest, in case the apparatus leaks. This is readily accomplished by caulking the joints of the stop-cock on the canula with soap, or putty, or tallow.

Clearing the Canula.—If the canula should become, in the course of the operation, clogged by any flaky or fibrinous matter, it can be cleared, generally, by the following simple manœuvre. The elastic tube is firmly compressed between the finger and thumb of the left hand at a distance of some eight or ten inches below the canula; then the finger and thumb of the right hand are placed compressingly just above those of the left, and, by a rapid movement, they are slipped up along the tube, still tightly compressing for a few inches. This causes a momentary forcible reflux of fluid through the canula, which dislodges the obstacle impacted in it.

If this be insufficient, both stop-cocks (that on the canula and that at the lower end of the elastic tube) must be shut. The elastic tube is then unscrewed from the canula, and the latter cleared, either by the introduction of the trocar or a probe. The tube is then screwed on again, and the operation proceeded with as at first.

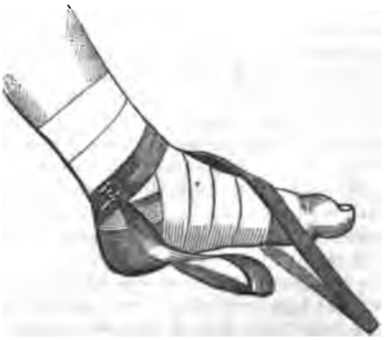
Judging from my own experience, the evacuation of abscesses by this method is only advisable in the case of large chronic abscesses, when it is important to prevent the admission of air. In such cases only the larger trocar is generally available, on account of the numerous flakes usually mixed with pus. —*Liverpool and Manchester Med. and Surg. Reports*, 1878, *p.* 66.

37.—ON THE TREATMENT OF TALIPES VARUS.

By Frederic Clowes, Esq.

[Mr. Clowes, of Windermere, recommends the following steps to be taken in these cases. He says]

In the latter stages of the treatment of this deformity the slipping backwards and upwards of the heel is often very embarrassing. Even after free tenotomy the treatment is often hindered and delayed by it in restless children, and it is not easily prevented by any of the various modifications of Scarpa's shoes with which I have been supplied. A very simple arrangement in bandaging does, however, entirely prevent this slipping of the heel. After the bandage has been applied in the usual way to the foot and ankle, a broad tape or narrow bandage should be passed over the front of the ankle, round the limb, and crossed behind it just above the heel, then carefully sewn to the bandage on each side *below the malleolus* to prevent its slipping, as shown in the drawing.



When the foot thus prepared is put into the shoe, the ends of the tape will come out in front of the heel-piece and should be tied tightly under the sole of the instrument. It will be seen that this strap opposes the action of the instep straps of the shoe, and if all these are sufficiently tight the heel is held firmly down to the sole of the apparatus. This complete fixity of the heel is the great desideratum, both as regards obtaining flexion of ankle, eversion of foot, and unfolding its distortion. So that the surgeon who can accomplish this has overcome his greatest difficulty. This plan is especially applicable to the large class of more or less relapsed cases in which re-operation is often resorted to—one of the "unnecessary operations" of Dr. Little. Cases of this kind, which formerly I should scarcely have attempted to treat without re-operation, have been, I may say, rapidly cured since I have adopted this simple means, availing myself also of the advantage of Dr. Little's double-hinged lever instrument with thumb-screw movement, which gives the patient the benefit of a stop-joint, set at any angle required.—*Lancet*, *Feb.* 1, 1878, *p.* 186.

38.—ON THE OPERATION OF OPENING THE LARYNX BY SECTION OF THE CARTILAGES, FOR THE REMOVAL OF MORBID GROWTHS.

By Arthur E. Durham, Esq., Surgeon to, and Lecturer on Anatomy at, Guy's Hospital.

The operation of opening the larynx by section of the cartilages, as well as of the soft parts, in order to facilitate the removal of morbid growths and foreign bodies, is by no means a new one. It was suggested, clearly described, and strongly recommended by Desault some hundred years ago; and indeed it is still sometimes spoken of as "Desault's operation." It does not appear, however, to have been ever actually practised by that distinguished surgeon. But of late years—and especially since the use of the laryngoscope has rendered the diagnosis of laryngeal affections comparatively easy and certain—it has been repeatedly performed in this country, and somewhat more frequently abroad. Nevertheless, so far as I am able to judge, the merits of this method of proceeding are, as yet, neither so generally recognised, nor so highly appreciated as it seems to me they deserve to be; while on the other hand the difficulties and dangers involved are very commonly and very greatly overestimated.

Case.—[A female, nine years of age, was admitted into Guy's Hospital in 1862, suffering from such urgent dyspnœa that tracheotomy was at once performed. During the next four years she was admitted no less than eleven times.]

The most persevering attempts were made from time to time to obtain a view of the interior of the larynx. But the extreme sensitiveness of the parts, and the obstinate resistance of the patient defeated all such attempts until during her last stay in the Hospital. In July, 1866, I succeeded in seeing quite distinctly a considerable warty growth on the left false vocal cord, and in making out, though somewhat less positively, that the whole of the larynx was blocked up by similar growths.

On 27th of July, chloroform having been administered through the tracheotomy canula, I passed a small curved sharp-pointed knife straight through the superficial structures, the crico-thyroid membrane and the mucous membrane of the larynx, and cut directly upwards in the middle line through the thyroid cartilage, &c., thus dividing all the structures by one incision as high as the thyro-hyoid membrane, which was only slightly cut. The cricoid cartilage was subsequently divided in order to give more room. Some hemorrhage and somewhat severe spasmodic cough followed the first incision. When these had subsided (which they did very speedily), and the lips of the wound were drawn apart, it was at once seen that the whole cavity of the larynx was stuffed with warty growths varying in size and precise situation. The largest was that already mentioned as seen by aid of the laryngoscope on the left false vocal cord. There were none, or only two or three minute ones, *below* the true vocal cords; but with this exception, the mucous membrane of almost every part of the interior of the larynx was covered with them. All were carefully removed; some were cut off with scissors, others were twisted off with forceps. The slight bleeding whichensued was easily arrested by free exposure to the air, and temporary pressure by means of sponges. The wound was closed by sutures and strapping. The tracheotomy canula which had not been in any way interfered with during the operation was left *in situ*.

The next day the patient could breathe through the larynx, and could produce audible sounds.

On the seventh day after the operation the recent wound had entirely healed. On the 10th day the tracheotomy canula was removed, after having been continuously worn for just four years. The opening very speedily closed up; and on 22nd August, not quite a month after the operation, the patient left the Hospital in excellent health, breathing easily and well, and able to speak quite audibly.

I last saw her about a year ago, more than four years after the operation. She had grown into a fine thoroughly healthy young woman, breathing and speaking as though she had never had anything the matter with her larynx. Her mother said of her "You might hear her singing from the top of the house to the bottom."

Laryngoscopic examination showed no indications of any return of the growth.

Having attempted to show that the danger to life attending this operation is comparatively small—at any rate very considerably less than has been represented—I pass on to make a few remarks upon some of the difficulties likely to be encountered.

Judging from my own experience and observation, and from a careful study of the recorded experience of others, I have no hesitation in expressing the opinion that such difficulties are fewer, and more easily overcome than appears to be generally supposed.

First, with regard to hemorrhage: If the incision is kept strictly to the middle line, it is impossible that any large vessel can be wounded. Moreover the parts are necessarily divided to such an extent that any wounded vessel is fully exposed and easily secured. The effects of entrance of blood into the trachea *look* much more formidable than they really are. If only the divided parts are widely opened out, and so maintained that the air may enter freely, any blood that may be drawn in (or, at any rate, the greater part of it) is sure to be very quickly coughed out again. There is a great difference between the conditions in this operation and those in a simple tracheotomy. In the latter case the opening made into the air-passage is comparatively small, deep-seated, and, it may be, half-hidden. Blood may possibly, therefore, enter from some unseen source more quickly than air, and more quickly too than it can be expelled. But when the cartilages of the larynx are divided, there ought to be easily maintained both free entrance for air and free exit for blood.

Bleeding from the internal surface of the larynx is easily enough controlled and arrested by pressure or the application of styptics when the bleeding surface is so completely exposed to view as it may, and ought to be in this operation. The difficulties that are stated to have been met with appear to have arisen in great measure from insufficient exposure of the parts.

The introduction of a tracheotomy canula (in case tracheotomy has not previously been performed) into the lower part of the wound, and the insertion of a small piece of sponge into the trachea above the canula, may afford material aid in securing free respiration and hindering the flow of blood down the air-passages.

The spasmodic up-and-down movements of the larynx, and the violent paroxysms of cough that occur when the larynx is opened, may often give rise to trouble and delay in the operation. But after a little time, the parts being allowed to remain at rest, these symptoms subside; and, although for a period they may seem alarming, no danger need be apprehended if only a full supply of air is ensured.

Next, with regard to the division of the cartilages:—Experience shows that the operation may be easily and successfully accomplished, even though the cartilages are densely ossified. In such case, however, cutting forceps or strong scissors answer better than the knife.

There is no great difficulty in avoiding the vocal cords while cutting through the thyroid cartilage. In only one case among those recorded in the Appendix it is stated that one of the vocal cords was accidentally injured. In this case no material harm resulted, though the voice was probably less perfectly restored than might otherwise have been the case. If the opening is commenced below, and a grooved director passed up between the vocal cords, their safety may be absolutely insured; but such a proceeding I believe to be unnecessary, it seeming to me to be the best plan to divide the cartilages by cutting through them from without inwards, and from above downwards, and to separate slightly the alæ of the thyroid cartilage before actually penetrating the mucous membrane.

In the removal of the growth no great difficulty is likely to occur unless some important part of the larynx is structurally involved in the growth. In such case the part involved may be removed to a greater or less extent with the tumour,—as was done in a case recorded by Kœberlé, in which he removed the right vocal cord with the growth, and exposed the internal surface of the thyroid cartilage (see Case 20 in Appendix); or, some portions of the growth may be cut away and the remainder deeply cauterised; or it may prove necessary to abandon the operation altogether. But whatever difficulty may arise in the removal of the tumour, whether from its nature or connections, it is obvious that such difficulty can be overcome much more readily and much more certainly when the larynx is freely opened, as in this operation, than could possibly be accomplished by any method of proceeding carried on through the natural passages.

In a considerable number of the cases in which this operation has been attended by success, many abortive attempts had previously been made to remove the growths through the mouth—attempts that were defeated in part by the difficulty experienced in detaching the growths.

With regard to the best method of performing the operation, and the precautions to be observed, little need be said beyond what has been already advanced or may be gathered from the records of cases. The various methods adopted by different surgeons are duly described with the general details of the several cases. The extent to which the laryngeal walls should be incised must of necessity be determined by the precise situation and extent of the growths which are to be removed. As a general rule it is probably best to begin by dividing the thyroid cartilage and crico-thyroid membrane, and subsequently to continue the section upwards through the thyro-hyoid membrane, and downwards through the cricoid cartilage and upper rings of the trachea to such an extent as may be necessary in order to expose fully and completely the bulk and points of attachment of the growth or growths. Experience has shown, as may be seen on reference to the Appendix, that cases in which both thyroid and cricoid cartilages, thyro-hyoid and crico-thyroid membranes, and the upper rings of the trachea have been divided, have been followed by results as successful as those obtained after section of the thyroid cartilage alone.

The questions,—1st as to whether tracheotomy should be performed as a preliminary; and, 2ndly, as to whether it is desirable to leave the canula in the trachea after the major operation has been completed,—must be determined by the circumstances and conditions of the particular case to be dealt with. In many instances it has happened that there has been no option, and tracheotomy has been performed under urgent necessity, and at times when the major operation would have been impracticable, or even perhaps before it has been possible to arrive at a satisfactory diagnosis.

There can be no doubt that in the majority of instances it is advantageous that a canula should be in the trachea, while the growths are being removed, and until all bleeding has ceased. But so far as the result is concerned it would appear to matter very little whether the trachea has been opened at some anterior period, or whether this has been done as a first act in the major operation. In each of my own three cases tracheotomy had been performed some years previously—in Mr. Colley's case a short time previously—while in Mr. Bryant's the tracheotomy and the opening of the larynx formed parts of one and the same operation. In all cases in which the growths have been numerous, or their attachments have been extensive, and in which, therefore, the mucous membrane of the larynx has been exposed to much damage and rendered especially liable to become inflamed, I think it desirable to leave the canula in the trachea, at any rate for some days, as a safeguard. It is true Debron considered the presence of the canula to have indirectly conduced to the death of his patient. But this can be regarded only as a very exceptional occurrence. In case the growths should be few or single, and the mucous membrane but slightly interfered with, it may perhaps be considered safe to dispense with the use of the canula and to close up the whole wound at once. —*Medico-Chirurgical Transactions*, vol. lv, 1872, p. 17.

39.—NEW FRENCH METHOD OF DRESSING WOUNDS.

By Dr. WALTER REID, Surgeon, R.N.

A new method of dressing wounds, at present attaining great popularity amongst French surgeons, is that which is known as the "pansement ouaté" of M. Alphonse Guerin, of the Hotel Dieu. It consists in the use of large quantities of cotton wadding, somewhat after the manner of treating extensive burns by the same material. About two years ago, towards the close of the war, and during the days of the Commune, M. Guerin first put this in practice in the Hopital St. Louis. The properties which cotton wadding possesses of filtering the atmosphere, the regular elastic compression and uniform temperature which its application induces, were qualities which he thought might be turned to good account in the treatment of wounds and other surgical diseases. An attendance of nearly six months in the hospitals of Paris during the course of the winter has enabled me to write with some authority on this subject, which well merits the attention of the profession in this country. The method is peculiarly applicable to cases of amputation, and in order to describe the manner of using it I will suppose a case of circular amputation at the thigh. Bleeding being carefully stopped, the ligatures are cut short, except that of the main artery, which is allowed to remain of the usual length. The wound is then washed with a solution of camphor and alcohol, of carbolic acid, or other disinfectant. The stump being now elevated and the loose integuments slightly stretched outwards by an assistant, portions of cotton wadding are inserted so as completely to fill without distending the cavity thus formed. Several layers of the same material are then applied over the stump, and carried in the form of broad rollers round the limb as high as the groin or pelvis. The volume of the whole ought to be at least three times that of the thigh, or about the circumference of the patient's waist. A number of bandages are then carefully applied, the constriction being at first moderate, but gradually increasing until it is as powerful as the hands of the surgeon can make it. The limb is now placed in a horizontal position, supported by a pillow, and allowed to remain so for twenty or thirty days.

The first thing that strikes the surgeon is that the patient, during the whole of this period, is free from pain, which neither comes on spontaneously, nor is it induced by the contact of surrounding objects, or by their shock. A peculiar odour is generally exhaled during the first ten or fifteen days, which, however, can be destroyed by the use of disinfectants applied to the outside of the apparatus.

M. Verneuil, the accomplished Professor of Clinical Surgery in the Hopital de la Pitie, has paid great attention to the temperature in these cases. He finds that it averages 38·5° C. (101·3° F.) during the first twenty-four or forty-eight hours. It then returns to the normal standard and never rises again. M. Guerin's own experience is similar.

I recently saw, in the service of M. Guerin, the removal of the dressing in a case of amputation of the upper arm after thirty-two days' application. On arriving at the deeper layers of wadding, they were found to be firmly glued to the integuments in the vicinity of the wound. About half a wineglassful of matter came away with the dressing. It had a peculiar odour, not that of putrescent pus, but which M. Guerin attributes to the confined sebaceous secretion. The skin was quite normal, being free from redness, swelling, or any other sign of diseased action. The end of the bone was well covered by healthy granulations, as was also the whole of the traumatic surface; in fact, there was only a healthy granulating ulcer with the characteristic blue margins, showing that the process of ciatrisation was going on. M. Guerin regarded this case as a good specimen of the ordinary result of the cotton-wadding dressing. It was reapplied for another period, which he hoped would complete the cure. Two applications are generally sufficient; a few strips of adhesive plaster is all that is necessary afterwards, if the ulcer is not quite healed.

The dressing is also applicable to other diseases such as abscess and sinus, especially when connected with joints. I saw a case of synovitis of the knee-joint with sinuses treated by M. Guerin. The sinuses were laid freely open, and the apparatus applied. It has been removed since my return to England, but Dr. Blanc, of the Indian Medical Service, was present at the removal, and writes as follows: "The result was beautiful; all the incisions healed, and the knee about the same size as the healthy one." In these cases it is necessary to apply the wadding from the toes to the groin, in the upper extremity from the fingers to the shoulder.

In having recourse to this method of dressing, various precautions must be attended to. The patient during its application ought to be removed to an apartment where the atmosphere is pure, and then carried back to his own ward. The compression by the bandages ought to bear on all parts alike, and be at the same time powerful. It is therefore necessary occasionally, during the first twelve days to apply more wadding and bandages, so as to conduce to this end. In amputations at the thigh the stump is liable to elevate itself, and cause the bone to protrude; this will be avoided by maintaining it in the horizontal position. The temperature must be taken regularly morning and evening, as it will give the first indication of anything going wrong. Nothing need be apprehended if it remains normal after the first forty-eighty hours.

The advantages contended for by the advocates of the "pansement ouaté" are—

1. Avoidance of the action of the air, which irritates not only by its physical properties, but also by reason of the minute organised bodies which its holds in suspension.

2. A compression, firm, elastic, and sustained, which moderates the afflux of the blood, and produces rigorous immobility of the parts, both in themselves powerful antiphlogistic agents in the treatment of wounds.

3. Remarkable diminution and frequently total absence of pain.

4. Constant uniform temperature of the parts, also an important agent in the treatment of wounds.

5. The ease with which it is applied, and the avoidance of the evil consequences of dressing the wound daily or every two days.

6. The protection afforded locally, thus facilitating the transport of the sick and their dissemination in crowded hospitals.

Lastly. The statistics of M. Guerin show a very marked diminution in the mortality of his large operations since his adoption of this method. Thus, during the troubles in Paris, when his wards were crowded with wounded men under the worst conditions, nearly all his large operations were fatal; but after its employment he had nineteen successful cases out of thirty-four large operations.

I might also mention its safety. Out of numerous cases, I have not seen an untoward accident, nor have I heard of any which might be fairly attributed to this new method of dressing. It seems destined to render great service to the practice of surgery, particularly to that of the navy and army, in the treatment, for example, of severe wounds or accidents on board men-of-war; when, owing to the motion of the ship, it is almost impossible otherwise to protect traumatic surfaces, or to obtain immobility of the parts. Again, on the field of battle there is no method likely to offer greater advantages in the treatment and transport of the wounded.

M. Guerin hopes in course of time, by a modification of the process, to obtain union by the first intention in flap operations on the extremities. Experience is as yet wanting on this point.—*Lancet, April* 26, 1873, *p.* 590.

ORGANS OF CIRCULATION.

40.—THE SURGICAL TREATMENT OF ANEURISM IN ITS VARIOUS FORMS.

By TIMOTHY HOLMES, Esq., M.A., Professor of Surgery and Pathology to the Royal College of Surgeons.

Aneurisms of the inferior mesenteric artery are rarer than those of the superior—at least to judge by the fact that I have met with only a single specimen in the same museums and books which comprise nearly a dozen of superior mesenteric aneurisms. The diagnosis during life would be hardly possible; but the lower origin of the aneurism would make its treatment by pressure more easy.

Turning to those abdominal aneurisms which are situated below the bifurcation of the aorta, we have the choice of several methods of treatment. A few years ago they were always treated (if treated surgically at all) by the Hunterian operation on the aorta, the common or external iliac, according to the height to which the aneurismal sac extended. The present practice is to attempt the cure of all such aneurisms by the total and rapid compression of the great trunk (aorta or common iliac) above. Mr. Syme recently, in a case of abdominal aneurism, founding his proposal on the undoubted fact that very frequently the orifice of the aneurism is accessible far below the upper limit of the sac, proposed to revive the old operation in these cases. And this will, I think, be a convenient part of the course to discuss the propriety of reintroducing this method of treating aneurism into general practice.

The old operation, or that of laying open the sac of the aneurism and tying the artery on either side of its aperture into the sac, has been considerably more common of late years than it was during the earlier part of this century. Indeed, the first success of the Hunterian operation was so striking, its advantages in popliteal aneurism were so indisputable (and the popliteal were almost the only spontaneous aneurisms which used to be the subjects of operation), and, by means of the happy audacity of Abernethy, Astley Cooper, Aston Key, Mott, and many others who were educated in the school of Hunter, the province of operative surgery had been extended to so many arteries which had previously been regarded as inaccessible, that it was no wonder if, at first, Hunter's operation was regarded as almost perfect, and no other means of cure were sought for. Thus Hodgson says that, "the improvements which have now been effected in the mode of applying the ligature to arteries have brought the surgical treatment of aneurism to a degree of perfection which leaves little room for advancement." Lawrence speaks of the Hunterian operation for aneurism as "extremely simple, of little pain, and still less danger."

To us who have seen popliteal aneurisms cured by such simple methods as flexion of the limb, or by a few hours of pressure, such an appreciation of Hunter's operation may seem extravagant; but if we remember the almost universal fatality of the old operation for popliteal aneurism, or of amputation (as testified by E. Home, Pott, and others), we shall not be surprised that at first the Hunterian operation appeared to be the only way of treating the disease, and incomparably superior to the old operation in every case of it.

But this was soon changed, as far as certain forms of disease were concerned. John Bell, and after him Guthrie, had shown conclusively that the ligature of both ends of the vessel was a far more trustworthy proceeding than ligature of a higher part of it in the case of a recent wound; and Guthrie, by a pardonable exaggeration very similar to the frame of mind which led his predecessors to over-estimate the Hunterian operation, himself strove to introduce the ligature of both ends of the vessel, even in situations where (as in the case of a wound of the internal carotid from the mouth) they are hardly accessible without the most grievous risk—even if they are accessible at all—and where the Hunterian ligature has often proved successful.

Reasoning both from theory and from his ample experience, Guthrie, in his lectures delivered before this College, not only showed with admirable force the method which should ordinarily guide the surgeon in recent injuries of vessels, but showed also that the same practice of incising the sac and applying ligatures on the two ends of the artery was the one which ought to be pursued in the varicose aneurisms which result from careless bleeding at the bend of the elbow, and might often be pursued with advantage in traumatic aneurism.

It is, however, to Mr. Syme that the profession in England is chiefly indebted for the renewed prevalence of the old operation. In his well-known papers on Axillary Aneurism, published in the forty-third volume of the Medico-Chirurgical Transactions, Mr. Syme opens the whole question in the following somewhat startling language:—"Some traumatic aneurisms, more especially those of the smaller arteries, were deemed proper exceptions from the new system; but, as the great leading principle of practice, it was universally admitted that the disease should be combated by ligature of the artery beyond the confines of the tumour. Such is the principle which, in common with other teachers of surgery, I have inculcated for more than thirty years, and of which I now feel it my duty to question the soundness."

Mr. Syme's opinions on this subject, at least as far as axillary aneurism is concerned, can hardly be said to be entirely novel, since the same idea of the greater applicability of the old than the new operation in this form of aneurism had been held by Velpeau. Velpeau speaks as follows:—"The method of Anel (in which term he includes Hunter's operation) has many incontestable advantages over the old operation. Yet this latter ought not to be entirely rejected. It ought to be preferred, for example, in diffused superficial aneurisms; in those which affect the brachial artery very near the axilla; in those of the axilla itself, when the shoulder is infiltrated, or so far deformed as to render it dangerous to attempt to operate in front of or above the clavicle; and in aneurisms in general, when very voluminous, or when gangrene of the sac is threatened, or when it is in the neighbourhood of an important and large collateral branch. Finally, in varicose aneurisms it is necessary to tie the artery above and below the opening."

Roux speaks as follows:—"Almost at the same time as the first operations for ligature of the external iliac were performed in England, Scarpa published the suggestion that in a case of inguinal aneurism the operation by laying open the sac might be brought to a successful termination if the surgeon could be extremely quick in finding the vessel and applying his ligatures. He relied on extreme address and presence of mind in the surgeon at a time when even the compression of the aorta through the abdominal parietes had not been thought of as a means of suspending for some moments the access of blood to the lower limbs." "The bold operation which Desault undertook is also well known in a case of large aneurism of the axillary artery, in which, not being able to render himself master of the hemorrhage, he had the misfortune to see his patient expire under his eyes immediately after the opening of the sac."

The passage of Scarpa referred to by Roux is to be found at p. 341 of Wishart's translation. It refers not to abdominal, nor, in strictness of speech, to inguinal, but to femoral aneurism, since Scarpa makes it a condition of its performance that there should be a "sufficient tract of sound artery below the crural arch to which the ligature can be applied;" but in other respects the operation described by Scarpa exactly represents that performed by Mr. Syme. Scarpa imagines a case in which the tumour extends so high that the operator "cannot reckon on the co-operation of an assistant for suppressing the current of blood through the ruptured femoral artery," and the only respect in which his operation differs from that of Mr. Syme is that he had not thought of the possibility of plugging the wound with the hand while feeling for the orifice between the sac and the artery, and so avoiding the jet of blood which will occur on laying the sac open, and which he describes as "violent and dreadful." He seems also to regard the relation between the artery and the sac in much the same way as Mr. Syme does.

Nor was Mr. Syme's practice absolutely novel, since Sir J. Paget had performed a similiar operation about two years previously, and another by Mr. Skey is related in the same paper. Still there can be no doubt that Mr. Syme's views were perfectly original, and that it is to his energetic advocacy and masterly operations that whatever prevalence this treatment has obtained is owing. Mr. Syme's second paper on the subject was published in the 45th volume of the same Transactions, and applied to the case of an abdominal aneurism. It rested on the reasoning of the former paper; but it is in connexion with this case that the question comes more distinctly under discussion, since Mr. Syme's first case, like Sir J. Paget's and Mr. Skey's, was not, strictly speaking, an aneurism, but a case of ruptured artery; and the theoretical reasoning which Mr. Syme uses with regard to the relations between the artery and the sac hardly applies to cases in which, as far as can be judged, there was no sac at all.

That reasoning will best be given in Mr. Syme's own words:—"In every aneurism, whether large or small, traumatic or spontaneous, the aperture of the artery is situated towards the centre of the tumour, so that a portion of the vessel, longer or shorter according to the size of the sac, is contained within its cavity, or rather embraced by its wall. Thus, in a very large aneurism ascending from below the groin nearly to the umbilicus, for which I tied the common iliac, the arterial opening was found to be only a little higher than Poupart's ligament; and it might always be expected to possess this relation to the cavity when the process of formation is kept in mind. It has become a long-established and generally-received principle in surgical pathology, that the extent of artery thus enclosed in the aneurism, or rather comprehended by its sac, is unsound and unsuitable for ligature, while the vessel beyond the confines of the tumour is free from any participation in the disease. But when this opinion is fairly examined it will be found void of any good foundation, since the artery, though in some measure isolated from its neighbouring connexions by the effused blood, still retains the same relation as before to its sheath, and consequently, receiving a full supply of nourishment, is nowise unfitted for the process of obliteration by ligature. Indeed, when we trace the progress of an aneurism from its small beginning to a large size, it appears inconsistent with reason to consider the vessel sound so long as it can be felt beyond the tumour, and diseased so soon as it becomes overlapped or enclosed by the expanding sac. Whether the case be traumatic or spontaneous, there thus does not seem to be any reason for looking upon the portion of artery in question as unfit for being the subject of operative procedure. Under the influence of this consideration I have treated all the aneurisms at the bend of the arm, resulting from wounds of the humeral artery through venesection, which have come under my care, amounting to ten in number, by opening the sac, and applying ligatures on both sides of the aperture. Proceeding upon the same principle, in a case of carotid aneurism caused by the thrust of a knife at the lower third of the throat, and which extended from below the clavicle upwards, I did not scruple to lay open the cavity, and while hemorrhage was restrained by pressure of my finger, to tie the vessel above as well as below the aperture, with the happy result of saving the patient's life.

Again:—"The doctrine usually taught is, that the whole extent of an artery included by the aneurismal sac should be deemed of suspicious soundness if, indeed, not entirely absent, unless the case is traumatic, or proceeding from a wound of the vessel, which, of course, does not imply any morbid condition of the coats; while the spontaneous form, occurring without any assignable cause, or resulting from such injuries as blows and sudden extension, has been held to do so. But even although it were granted that an origin of the latter kind affords ground for suspecting unsoundness at the ruptured part, it by no means implies a similar condition throughout the whole extent of the tumour. For the sac enlarges quite independently of any change in the vessel, and, so far from weakening or destroying its coats, rather tends to consolidate and support them by increasing the density of the surrounding parts. If, therefore, an artery is considered sound beyond the limits of an aneurism of the size of an egg, it should still be so regarded after the tumour enlarges to the bulk of an orange, or any greater magnitude, the extent of arterial disease being in no wise proportioned to that of the aneurismal sac. Proceeding upon this principle, and trusting to find a sound portion of artery within the sac, I have repeatedly operated with success by laying open the cavity, and securing the orifice by ligatures. Of the cases thus treated, certainly the most remarkable is that which I am about to relate; and it so strongly supports the position in question, that any further evidence in its favour would seem hardly to be required."

Sir A. Cooper, in his attempt to perform the old operation in the case where he afterwards tied the aorta, was guided by a similar view of the usual (he does not say the universal) state of things in aneurism. "I determined to ascertain whether it were practicable to pass a ligature around the artery from within the aneurismal sac; for I was of opinion that if the artery had given way near the centre of the sac, as it usually does in aneurism, I might compress it with my finger, and pass a thread around it."

On the other hand, the very basis on which the theory rests is thus directly assailed by Mr. Henry Lee in the same volume in which Mr. Syme's case of successful operation on an abdominal aneurism by the old operation was related. "An examination of the preparations of aneurisms of the larger arteries, as they exist in the museums of London, will show that the very great majority of these are of the fusiform character, formed by the dilatation of all the coats of the vessel. The cases in which the artery, of its natural size, is to be found running by the side of a portion of the sac, in such a position as to admit of a ligature being applied to it, are very exceptional. It would, therefore, appear that the operation which has lately been described can be applicable to a very limited number of cases; and that, if repeated, the surgeon would, in a very great majority of instances, find only 'a chaos of broken coagula,' as happened in Sir A. Cooper's operation."

The controversy, I think, resolves itself into the following questions:—1. Is it true, as Mr. Syme says, that in every aneurism there is only a limited portion of the vessel contained within the cavity of the sac or embraced by its wall? 2. Is that limited portion capable of supporting the ligature and taking on reparative action? 3. Can the operation be performed with confidence on the part of the surgeon that he will complete it? 4. And, finally, admitting all this is so, is it a preferable method to the other ways of treating a given case?

[After discussing these questions in his next lecture, Mr. Holmes says:]

The evidence before us justifies the following conclusions:—

1. That the relations between the artery and the sac which Mr. Syme represented as being universal, are not so. That there are many cases in which, the aneurism being of the tubular variety, the two openings are separated by unknown distance, so that it would be very difficult, or perhaps impossible, to find them; and that there are others of the sacculated form in which the portion of artery embedded in the sac is so extensive, and the sac so thick, that it would be very difficult to tie the artery.

2. That in spontaneous aneurism, especially abdominal, it must always remain doubtful whether the portion of artery so tied will bear the ligature.

3. That in aneurisms which grow rapidly in large cellular spaces, such as those of the abdomen, it must always remain doubtful whether, in an operation of this kind, the surgeon will succeed in finding the artery; that usually his only chance of doing so will be by laying the cavity open most freely, perhaps in the whole of its extent, and that this cannot be done without unjustifiable rashness, unless the aorta is secured by compression.

4. That on this account the old operation can hardly be applied, except to aneurisms which as a rule will be amenable to the far more safe though less certain treatment by compression.—*Lancet, Feb.* 8 *and March* 1, 1873, *pp.* 195, 296.

41.—CASE OF POPLITEAL ANEURISM CURED BY DIGITAL COMPRESSION IN EIGHT HOURS.

Under the care of WM. MAC CORMAC, Esq., Assistant-Surgeon to St. Thomas' Hospital.

George T., aged 64, painter, admitted August 31, 1872, for pulsating tumour in left popliteal space. Patient states that thirty years ago he fell from a ladder and fractured left patella, for which he was under treatment at St. Bartholomew's Hospital for four or five weeks. He has since been unable to flex his leg thoroughly, but beyond this has felt no inconvenience. Fourteen years ago he fractured the left femur, and was under treatment at Westminster Hospital four months. About three weeks before admission he slipped and sprained his left leg; this scarcely attracted his attention until three or four days after, when he noticed a small tumour at bend of left knee.

On admission the patient was found to have a large pulsating tumour, about twice the size of a hen's egg, in the left popliteal space. Pulsations correspond with pulse, and cease when femoral is compressed. The arteries in arm and leg are tortuous and cord-like. The brachial arteries appear quite subcutaneous, very hard, incompressible, and tortuous, and may be seen almost throughout their entire extent.

September 2. Noon: Digital compression to femoral artery commenced by a relay of dressers, ten minutes each; the pressure kept up unintermittingly for eight hours. 2.30 p.m.: Foot and leg cold. Aneurism smaller; it has a soft feeling. Hot baths to feet. 3.30 p.m.: Leg becoming congested and swollen. Cotton-wool and bandage to leg. 4.30 p.m.: Very excited. Tumour considerably diminished, much harder, and pulsations less. 8 p.m.: Digital compression discontinued; pulsation in tumour entirely stopped. Signorini's tourniquet applied to femoral artery at apex of Scarpa's triangle, and gentle pressure employed to modify current of blood. Temperature of left foot is now higher than the other. During the progress of the treatment by compression, and also a few hours after, he was considerably quieted and composed by the injection of morphia (gr. ⅓) subcutaneously at four different times—a grain and a half was injected in twelve hours.

3rd. Slept well. Temperature of left leg, 100°; right, 98·4°; axilla, 101·4°. No perceptible pulsation in tumour; congestion of left leg has subsided; left femoral can be felt pulsating in Scarpa's space, and the articular arteries enlarged. Hot bottles to feet continued.

4th. Rather restless early part of night. Repet. morph. inject. gr. ⅓. Tumour still hard; no pulsation. 1.30 a.m.: Tourniquet discontinued.

5th. Tumour softer and smaller; some slight abrasion of skin from tourniquet, which was discontinued. Temperature of left leg lower than right.

9th. Extremities of all the toes (second excepted) discoloured. Temperature of the left foot higher than right.

12th. Line of demarcation appearing.

17th. Gangrene of toes not extending, except that of great toe; tumour about the same. Patient rather feverish.

21st. Extremities of toes blackened. Complains of considerable pain at night. Inj. morph. hydrochlor. gr. ⅓.

October 7. Charcoal poultices applied to foot. Mixed diet, beef-tea, wine, &c. Complains of pain in heel and left foot; leg placed on Liston's back splint.

November 1. Gangrene has extended to distal extremity of first phalanx of all the toes except second, and there is some sloughing of heel.

December 5. Gangrene quite limited; dead parts nearly separated; sloughing over outer and back part of heel has extended down to bone. Linseed-meal poultices now applied over the granulating stumps of toes, &c.

Result. The patient is still in hospital on account of the tardy healing of the stump of the great toe. The aneurismal tumour has quite disappeared, and his general health and condition are much improved. With arteries so seriously diseased as they evidently were in this case, the treatment by compression was the only method likely to succeed. The ligature would probably have been followed by secondary hemorrhage.—*Medical Times and Gazette, Feb.* 8, 1873, *p.* 140.

42.—A NEW MODE OF APPLYING PRESSURE IN POPLITEAL ANEURISM.

By Dr. **Henry Thompson**, Surgeon to the Tyrone Infirmary.

Some years ago, having had occasion to treat a case of popliteal aneurism, and neither possessing, nor having any means of procuring within the necessary time, the clamps and other appliances hitherto employed for the purpose, I was obliged to devise some plan by which the object could be accomplished by the means that were at my disposal, and, after some little thought, I adopted an apparatus similar in principle to that of which a woodcut accompanies this brief notice. Precluded from the use of the screw, I did not see why another of the mechanical powers, the lever, might not be brought into requisition, particularly as by a simple expedient, well illustrated in the woodcut, it would be easy to adapt it to Carte's principle of elastic pressure.

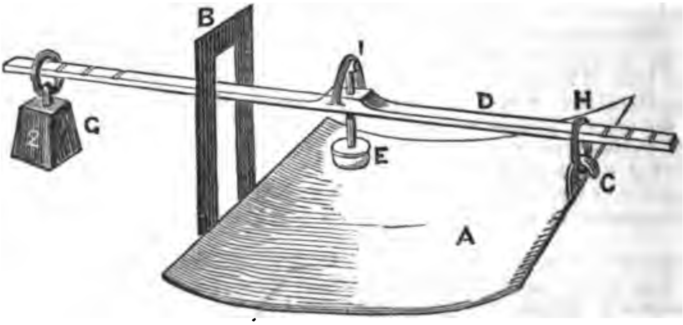
The plan was found quite successful, as far as its power of controlling the circulation through the femoral artery was concerned, and would certainly have effected a cure, had the other circumstances of the case admitted of it; but the patient had a thoracic aneurism, accompanied with a diseased state of the blood, which prevented coagulation, and of which he ultimately died.

The progress of the external aneurism was, however, so materially checked by the use of the instrument as to prove its power of doing all that was requisite under more favourable conditions.

Within the past two months another case has occurred to me, which has given me an opportunity of verifying my anticipations, by the production of a complete cure of a popliteal aneurism by the use of this instrument alone. I have, therefore, no further hesitation in recommending it to the profession, as possessing some advantages over those hitherto in use:—First, It adopts the principle of elastic pressure to the fullest possible extent.

Second, It is easily made by anyone who can cut sheet iron; and

Third, It can be watched and managed by the patient himself with the greatest ease and comfort.



Dr. Thompson's Instrument for the Treatment of Popliteal Aneurism.

As illustrated by the woodcut, the instrument consists of A, a piece of sheet-iron, 14 inches by 10, hollowed and padded to receive the pelvis, and furnished with B, a portion of the same piece of sheet-iron turned up perpendicularly, and a slot cut in it to receive the lever. C, another piece of the sheet-iron exactly opposite the slot, turned up and bent down into a hook, to hold a strong elastic ring, H, to form the fulcrum. D, the lever, a thin lath of deal 2½ feet long, ¼ inch thick, and 1½ inch wide, with a square mortice cut in it at I, where its thickness should be doubled. This mortice is to receive the stem, which supports the compressing pad E, and the opposite end of the stem is fixed to the sides of the lath by a stout piece of elastic band which passes over the end of the stem and is tacked to the sides of the thick part of the lever. G is a two-pound weight slung over the free end of the lever, forming the compressing force, which can be increased or diminished by moving the weight out or in. The position of the pad on the vessel can also be changed as required by moving the pelvis an inch or two up or down, which the patient soon learns to do for himself, without relaxing the pressure on the artery. With this apparatus I have kept up continuous pressure for 12 hours without interruption.—*Dublin Journal of Medical Science, March* 1873, *p.* 229.

43.—ACUPRESSURE; WITH A DESCRIPTION OF A MODIFICATION.

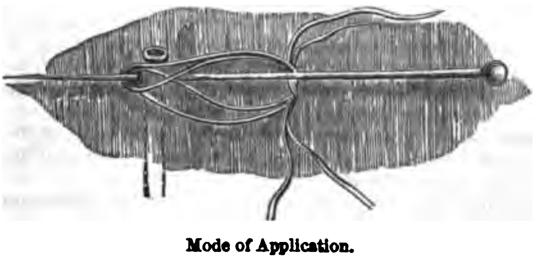
By Dr. J. C. Ogilvie Will, Aberdeen.

Having attentively watched the progress of acupressure for nine years, during which period I have seen several thousand vessels acupressed, and having had ample oppportunities of carefully comparing it with the various methods for arresting surgical hemorrhage resuscitated or invented since Sir J. Y. Simpson's introduction of temporary metallic compression of cut vessels, and having seen that the results obtained where acupressure has been used are infinitely superior to those where torsion, or silk, or carbolized catgut ligatures aided by multifarious carbolized dressings, have been employed, I am naturally anxious to do anything to aid its advance. With this aim I purpose bringing before the profession a slight modification of acupressure, which will, I trust, from its simplicity and evident security, find favour with such surgeons as are desirous of employing a hæmostatic which can easily be withdrawn when the period has arrived after which the presence of any foreign body in a wound, instead of adding to the patient's chances of recovery, must certainly militate against it.

Many surgeons, both British and foreign, have informed me that they entertained insuperable objections to the use of the wire in the method now called "circumclusion," on account of the danger of disturbing the clot, and also on account of the disturbance of the tissues caused by the "corkscrew" of wire during its withdrawal; they also stated that, as the other methods suggested did not seem to them to be sufficiently reliable, they did not feel warranted in giving up the use of the ligature in favour of acupressure.

To obviate this difficulty I now suggest, as a substitute for the wire, ligatures made of silk, well waxed and soaped, or catgut. The method of application will be easily understood by a glance at the accompanying engravings, assisted by the following short description.

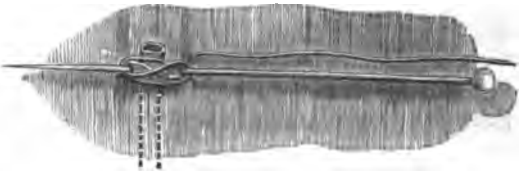
Pass a pin underneath the vessel to be secured, making its point emerge a line or two on the other side of the artery; take two loops of ligature, place first one, then the other, over the point of the pin, bring them in front of the vessel, and tie by the usual surgical knot behind and a little to one side of the pin; lastly, cut off three ends, and bring out the remaining one by the side of the pin.



Mode of Application.

Two loops may seem unnecessary, but it is not so; for, when only one is used, it takes such firm hold of the tissue about the vessel that, during its removal, the safety of the clot is endangered.

To withdraw: First remove the pin by a gentle twisting motion; after which, the knot being liberated, the ligature can be readily pulled out. I may here observe that the ligatures depicted in both sketches are rather more "rope-like" than I intended; and in the second they appear to be less tightly drawn than would be desirable when in actual operation.



Completed.

The advantages of this method are: 1, reliability; and, 2, the slight disturbance caused to the vessel and other parts during its removal. The only drawback to its use is the possibility of irritation being excited by the ligature; but as its sojourn in a wound would be of so short duration, such an objection could hardly be sustained. I would only advocate the use of filo-acupressure—if I may so call it—in the case of the larger vessels; retroclusion, which Sir James Simpson often told me he considered the best of all modes when a pin alone was to be used, and, perhaps, torsoclusion, being employed for the smaller. I need only name these methods, as a full description of them may be found in an exhaustive paper on Acupressure by Professor Pirrie in the Lancet, June, 1871. (See *Retrospect*, vol. lxiv. p. 194.)—*Lancet*, *April* 12, 1873, *p.* 524.

44.—CASE OF ANEURISM OF THE ARCH OF THE AORTA TREATED BY GALVANO-PUNCTURE.

By Dr. McCall Anderson, Professor of the Practice of Medicine, Anderson's University; Physician to the Glasgow Royal Infirmary.

[The subject of this paper is a case of aneurism of the thoracic aorta, at the time under treatment at the Glasgow Royal Infirmary, by means of galvano-puncture.]

In this operation I employed a Stöhrer's battery, and a needle insulated to within half an inch of its point by being coated, as recommended by Dr. John Duncan, of Edinburgh, with a mixture of shellac and gutta percha.* The operations were performed thus:—The skin at the edge of the aneurismal swelling having being frozen with ether with the aid of Dr. Richardson's spray-producing apparatus, the needle, connected with the positive pole, was passed obliquely into the aneurismal sac. A zinc plate, connected with the negative pole, was then applied to the chest-wall on the opposite side and about three inches beyond the edge of the swelling, a sponge wrung out of warm salt water intervening between the plate and the skin. The cells of the battery were then raised in the usual way, and the traveller pushed up so as to bring four, six, or eight cells into use. When the process was completed the traveller was slowly pushed back, the zinc plate removed from the skin, and the needle extracted, a piece of plaster being applied over the puncture. The following are the notes of the case:—

Mrs. H., aged forty-six, married, mill-worker, was admitted under my care into the Royal Infirmary on the 8th of November, 1871. She appears to have always enjoyed good health until about two years and a half before this time, when, without any obvious cause, she began to complain of a "violent beating at her breast" and of hoarseness. About four months after the onset of the palpitation she first experienced a sensation as if a heavy weight were pressing upon her chest, and complained of lancinating pains between the shoulders, which extended down the left arm, and which gradually increased in severity.

---

* This gentleman seems now to prefer insulating the needles by vulcanite.

About eighteen months previous to admission she observed a swelling in the front of the chest, which was then about the size of a small hen's egg; it extended gradually at first, but much more rapidly during the last six months of this time. From the time of appearance of the tumour the palpitation became more marked, being also aggravated by movement; and dyspnœa set in so as to prevent her from lying with any degree of comfort save on her left side.

On examination her general health seemed to be good, although she was rather pale and had an anxious, suffering expression of countenance. On inspection of the chest the swelling above referred to was seen at the lower and inner part of the left infra-clavicular space and implicating also the upper sternal region. It was about three inches and a half in diameter, and its apex—for it was somewhat conical—was about an inch and a half above the surface. Pulsation and expansion could be distinctly seen and felt, and palpation elicited well-marked purring tremor over it. There was decided dulness, and percussion required to be done very gently, as the part was exceedingly tender. On auscultation, a well-marked systolic murmur was discovered, which was audible over a pretty extensive area, but was most distinct over the tumour. The left ventricle was the seat of dilated hypertrophy, the apex-beat being too extensive, and decidedly lowered and carried to the left, the impulse of the heart being strong and heaving, and the area of præcordial dulness increased in a downward and outward direction. There was no evidence of pulmonary complication, and, although there was considerable dyspnœa, the air entered both lungs pretty freely. The pulse was regular, but rather soft; it lagged preternaturally behind the ventricular systole; and the left pulse was rather weaker than the right both in the radial and carotid arteries. The pupils were not affected, and she had no difficulty of swallowing; nor was there any evidence of emaciation or trace of spasm of the glottis, although the voice was hoarse. Her appetite was fair, and her bowels regular; she had no fever, but she slept badly.

She was kept in bed, absolute repose, both mental and physical, being enjoined, but not very successfully enforced; and twenty-five grains of chloral every night, and ten grains of the iodide of potassium three times a day, were prescribed. Her diet was plain but nourishing, her bowels were carefully regulated, and stimulants were forbidden.

Within a fortnight from the commencement of the treatment the pains in the shoulders had in great measure disappeared, and she was sleeping well. The chloral was accordingly stopped, but the iodide of potassium continued.

On the 22nd of December, notwithstanding the pushing of this medicine, the tumour was evidently getting larger and softer. Accordingly, a bladder filled with a mixture of pounded ice and salt was ordered to be applied over the swelling for half an hour twice a day, dusting powder, composed of oxide of zinc, lycopodium, and camphor, being employed in the intervals to prevent irritation of the skin.

The freezing mixture promised well at first, for on the 31st January, 1872, it was noted that all pain had disappeared, except when a deep inspiration was taken, and she could lie in any posture. The patient thought the tumour decidedly smaller: it was certainly firmer, and much less tender, and purring tremor could no longer be felt over it, but otherwise there was little change.

Matters continued much in this state for some time, but during the month of March it was observed that the swelling was becoming gradually more prominent and softer, and by the end of the month it was evidently a question of days only when the red blush would appear upon the skin as a prelude to the fatal rupture. It was therefore determined, as a last resource, to try the effect of galvano-puncture.

On the 4th of April, all other treatment having been stopped, and with the kind co-operation of Drs. Perry and Finlayson, the operation was performed for the first time. It was continued for half an hour, four cells being employed for the first quarter of an hour, six for the second. For a short time after it there was slight expectoration which was tinged with blood, but the patient did not keep quiet as she had been told to do. Two days after the swelling was found to be firmer, and she could take a deep inspiration almost without any pain.

On the 9th of April galvano-puncture was employed for the second time, and was unattended by hemorrhage or complication of any kind.

On the 26th of April the following note was taken:—"The result of the two operations has been satisfactory. The patient now complains of no pain, and she can take a deep inspiration without any uneasiness. The tumour is decidedly smaller, and for the most part firm and solid. It still pulsates however; and the systolic murmur, though not nearly so pronounced, is still present. At its middle and lower part, too, there is a decided want of solidity, and here the pulsation is most distinct."

The operation was, therefore, repeated, the needle being passed into the soft part of the swelling.

On June 11th the following report was taken:—"Since last operation the improvement has been very marked. The tumour is now firmer at the lower part, is diminishing in size, and the pulsation is becoming less distinct. The murmur continues as before the last operation."

About this time she caught cold, and the cough, which lasted a couple of weeks and was pretty severe, was accompanied at first by hæmoptysis, about a wineglassful of dark-red blood having been expectorated in all.

On the 8th August the aneurismal symptoms remained unaltered, but the patient complained a good deal of palpitation and of irregular action of the heart. On this account tincture of veratrum viride was tried, at first in three, and latterly in ten-drop doses thrice daily, which moderated somewhat the violence of the cardiac action, while the feeling of irregularity vanished.

On the 27th August galvano-puncture was again made use of, six cells being employed for the first quarter of an hour, eight for the following five minutes, and six for the last ten minutes. The battery, having been recently reamalgamated, acted more powerfully than formerly, so much so that when eight cells were used she complained of decided uneasiness. She felt as if the needle was very large, and the left arm swollen and very tight; she also felt oppressed, complained of a burning heat in the chest, and had the feeling as if she could not survive if the current was not moderated. These symptoms passed off whenever the number of cells in use was reduced from eight to six.

The result of this operation was, that the swelling was further reduced in size and rendered firmer.

On the 26th October the following report was taken:—The symptoms of dilated hypertrophy of the left ventricle remain as at the period of admission into the infirmary, but for some time an apex systolic murmur has been audible, distinct from the basic one, and which was either not present at an earlier date or was obscured by the aneurismal one. The tumour is now only about one quarter of its size before galvano-puncture was resorted to; and it is for the most part very solid, much more so than the surrounding healthy parts of the chest. There is no trace of purring tremor, and its pulsation is much diminished, though still distinct, especially in the central, softest part of the swelling. The systolic murmur, too, is still present, although it is much softer than formerly. There is no change in the pulse. Patient feels in the most perfect health, and her only complaint is of a feeling of pulsation within the chest.

As far as I am aware galvano-puncture has only been employed on two other occasions in this country in cases of aneurism of the arch of the aorta. Both of them were under the care of Dr. Duncan, but in neither was the operation successful. It was performed twice in each case. In the first case the treatment was apparently commenced too late, for external hemorrhage had set in, and the patient died of exhaustion eight days afterwards. In the second case, the patient died from external hemorrhage two months after the first operation, but in this case the treatment did not get fair play owing to the distance from Edinburgh at which the patient resided. A few other cases have been recorded by other observers; thus Beard and Rockwell, in their excellent work on electricity, state that Nicolli was successful in two cases of aneurism of the aorta, although they give no details of them; and Dr. Althaus, in his Treatise on Medical Electricity, reports the following case of aneurism of the descending aorta, cured by Ciniselli:—The patient, aged forty-six years, had a round, pulsating tumour on the right side of the sternum, in the third intercostal space; it was six centimetres wide, and almost equally long, and was elevated about one centimetre and a half above the level of the walls of the thorax. Ciniselli believed it to be an aneurism of the lateral portion of the aorta descendans thoracica, and used for its cure three steel needles one millimetre thick, which were introduced into the third intercostal space, one being about two centimetres distant from the other. The positive pole was first connected with one of the needles, and the negative with a sponge-holder applied to the skin in the neighbourhood of the tumour. He then connected the positive pole with the second needle, and the negative with the first, where the positive pole had already acted, &c., until each needle had been in contact with both poles. The application lasted forty minutes; the skin had become reddened and swollen. After a few days these local symptoms abated; there was no general reaction. Sixty-six days after the operation the patient was completely cured.

In carrying out this treatment our aim should be to induce partial coagulation within the sac, in the hope that it may be followed by the slow deposition of successive layers of fibrine; for sudden coagulation is apt to induce inflammation and sloughing, while such clots are of necessity soft and easily detached so as to incur the risk of embolism. It is right, however, to state that, as far as I am aware, this has hitherto proved rather a theoretical than a practical source of danger. The needle employed was insulated with the view of preventing cauterisation of the skin and subjacent tissues, which might lead to inflammation or hemorrhage. Althaus thinks that such insulation is unnecessary, and that a slight action upon the skin is rather useful than otherwise by promoting shrinking of the sac, and preventing hemorrhage on removing the needles. Each of these opinions is, in a sense, correct; everything depends upon the strength and duration of the current; for, if the current is weak and not much prolonged, insulation of the needles is probably unnecessary, while, if the current is strong and long continued, its omission might prove dangerous. At the same time it must be borne in mind that, while inflammation should be avoided if possible, its occurrence, when moderate in degree, is not an unmixed evil, for it seems often to promote the cure.

In conclusion, let me say that I do not regard the case which I have related to you as an instance of perfect cure; but, at the same time, no one can deny the vast benefit which the patient has derived from galvano-puncture. For, although there is still decided fulness and pulsation, and slight murmur at the seat of the disease, she has neither ache nor pain, but says that she is in the most perfect health, and desires to be dismissed from the hospital and to resume work; whereas, had this treatment not been carried out, she would undoubtedly long ere this have been in her grave.—*Lancet, Feb.* 22, 1872, *p.* 260

45.—PLUGGING THE POSTERIOR NARES.

By Dr. R. P. B. Taaffe, Brighton.

Having on several occasions had to plug the posterior nares for epistaxis, and having once or twice (owing to the peculiar formation of the parts at the back of the mouth and fauces) found great difficulty in drawing up the plug from the mouth into the posterior nares, and having to use some force with the finger to push the plug up behind the soft palate, it struck me that a method might be adopted whereby the posterior could be plugged from the anterior nares, and so avoid the inconvenience and difficulty above-named, and also prevent the alarm created in the patient's mind at having a plug drawn into the posterior nares through the mouth. With this view Messrs. Weiss have had made for me an india-rubber nasal-bag of a pyramidal form. The lesser end being drawn into a small tube, the larger end can be introduced into the anterior nares, folded round a metal director and passed beyond the posterior nares. The director can now be withdrawn and the bag dilated with either air or ice-water by means of a syringe; a ligature being placed round the end of the tube, the syringe can now be detached, and traction being applied to the end of the tube, the nasal-bag plug can be drawn forwards so as to plug the posterior nares. In order that this may be done effectually, an inelastic band is let into the fabric of the tube and bag, so that good traction may be used without the material of the tube or bag becoming elongated or stretched. By this means I believe very firm pressure may be made against the walls of the nares, and so effectually plug the latter. In applying this bag I intend to cover it with an outer bag of lint which has been soaked (and afterwards dried) in a strong solution of tannin, alum, matico, or perchloride of iron.

The nasal bag plugs should be made in three sizes. There is figured in Messrs. Weiss's catalogue an instrument for epistaxis, invented by Martin P. Ange, which consists of a loose bladder or bag to be filled with water; I am not aware that this instrument has been largely adopted or found successful.

Should any of my professional brethren think fit to make a trial of these nasal-bag plugs (which can be procured from Messrs. Weiss), I shall feel much obliged by their publishing the result.

The nasal-bag plugs are inexpensive, and can be dilated by an ordinary brass ear syringe. The tube can be either ligatured or fitted with a stop-cock, but the ligature is most simple and least expensive, and answers all purposes. A metal director is supplied with the nasal-bag plugs.

I must add that I was aided by, and followed out in some measure, the form of uterine dilators invented by Dr. Barnes, and figured in Weiss's catalogue.—*Lancet*, *Jan.* 7, 1873, *p.* 32.

46.—AN IMPROVED MEANS OF PLUGGING THE POSTERIOR NARES.

By A. Godrich, Esq., M.A.

I beg to submit to professional notice an instrument that I have had constructed by Messrs. Louis Blaise and Co., of 67, St. James's Street, for plugging the anterior and posterior nares in cases of epistaxis. I have long been struck by the unsatisfactory means at our disposal in dealing with such cases. There is, in the first place, owing to its large curve, no little difficulty in passing Bellocq's sound, the point of the instrument often hitching on the posterior edge of the floor of the nasal fossa. In the next place, the adjustment of the posterior plug, requiring, as it does, the passing of the surgeon's finger into the fauces, not only causes much distress to the patient, but often entails a more or less severe bite on the operator, as I have found to my cost; and, lastly, when the plug is in position, the string passing from it through the mouth causes so much irritation of the soft palate and fauces, that but few patients have the courage to submit to it.

The instrument consists of a small elastic bag stretched on the end of a hollow style, by means of which it is pushed through the nasal fossa into the pharnyx. It is then dilated with ice-cold water by means of the ordinary ear-syringe, the nozzle of which is inserted into a piece of india-rubber tubing tied to the other end of the style. A small piece of thread or twine tied round this prevents the water from escaping. The bag, thus dilated, is now to be drawn well forward into the posterior nares, into which, by its elasticity, it will accurately fit. The anterior india-rubber plug is next to be slid along the style (this is more easily done if the style be previously wetted) into the anterior nares, which it fits like a cork. The cohesion between this plug and the style will, I think, be sufficient to hold both plugs in position; if not, a piece of string tied round the style in front of the anterior plug will ensure perfect security.

When it is necessary to remove the plug, all that the surgeon has to do is to cut the string tied round the piece of india-rubber tubing, when the water will be expelled by the elasticity of the bag, and the instrument may be removed without difficulty.

The instrument, even at its thickest end, where the elastic bag is stretched over the style, is not larger than a No. 6 catheter; and it can consequently be passed through the nasal fossa without the least difficulty, and with very little discomfort to the patient, as I have proved by frequently passing it through my own nose. The style being made of elastic material—in fact, a gum-elastic catheter, and therefore capable of being bent to any curve required—also facilitates the introduction of the instrument. When once the instrument is in position, and quiet, it is almost impossible to tell by the sensation alone that there is any foreign body in the nasal fossa at all; the dilatation of the bag causing but little discomfort, being above the sensitive soft palate and fauces.

In designing this instrument, it has been my object to combine simplicity and cheapness with perfect efficiency. If I have not fully accomplished my object, I ask any one to suggest any alterations that may bring this instrument nearer to perfection, and enable us to do away with our present barbarous and unsatisfactory plan of plugging the nares.—*British Medical Journal, April* 12, 1873, *p.* 400.

ALIMENTARY CANAL.

47.—REMOVAL OF THE ENTIRE TONGUE FOR CANCER BY THE GALVANIC ECRASEUR.

By Walter Whitehead, Esq., Surgeon to St. Mary's Hospital, Manchester.

Mrs. S., aged sixty-nine, from Oldham, presented herself to my notice on November 29th, 1872, suffering from cancer of the tongue. The primary nodule was detected more than a year ago on the right lateral half of the tongue, within an inch from the apex, and thence it had extended beyond the median boundary to the left side and backwards to the margin of the papillæ circumvallatæ. The surface of the indurated portions was ulcerated, and bore the characteristic features of cancerous origin. The excruciating pains, swelling, and inconvenience suffered by the patient were also those usually attendant on cancer of the tongue.

An operation for the removal of the tongue was arranged for December 4th. The patient being completely under the influence of chloroform, the tongue was firmly drawn upwards and forwards during the operation by a ligature which was passed through the tip. A loop of the galvanic écraseur wire was then passed into the mouth by a needle in the central line, midway between the jaw and the os hyoides, in close proximity to the tongue. The loop was then passed over the tongue into the sulcus in front of the epiglottis, and retained in this position by means of the forefinger of each hand until the wire had obtained firm hold of the structures within its grasp. At this stage, and not before, the galvanic circuit was made complete, and the platinum wires allowed to become sufficiently hot to give unmistakable indications of burning animal matter. A single turn of the écraseur screw was made every half minute, and during each pause the galvanic current was interrupted. About eleven turns of the écraseur sufficed to remove the tongue. No bleeding occurred either during or succeeding the operation, and immediately after the effects of the operation had passed off, the patient sat out of bed for a quarter of an hour.

For the first two days she was fed with warm milk, which she easily swallowed after it had been conveyed to the back part of the mouth by means of an ordinary glass syringe. Afterwards she was able to take fluid food naturally. A large slough separated from the floor of the mouth at the end of the second week, and a small slough came away from beneath the jaw about the same time; the latter left a fistulous communication with the mouth, through which the saliva escaped to an inconvenient degree. It however gradually contracted, and is now entirely closed. At the end of three weeks the patient returned home so far recovered as no longer to require further attendance. She was able when last seen, Jan. 28th, 1873, to articulate with admirable distinctness; and admitted to being free from all pain, and perfectly satisfied at having undergone the operation.

The écraseur used in this operation fulfilled all the requirements of an ordinary wire écraseur, and the combination of the galvanic cautery left nothing to be desired. The only objection to the operation, as performed in this instance, was that occasioned by the heated wire burning the structures in its course into the mouth; and this for the future ought to be obviated by dividing, according to the plan of Sir James Paget, the mucous membrane and structures connecting the sides of the tongue to the jaw, and also the attachments of the genio-hyo-glossi to the symphysis, close to the bone; and when the tongue is thus freed and drawn forwards, by adjusting the wire of the écraseur, so as to include the whole of it close to its connection with the hyoid bone.

Removal of the tongue in the restricted sense—that is, without attempting the entire extirpation of its deeper attachments to the hyoid bone—is one of almost absolute safety, and invariably followed by an alleviation of the unparalleled suffering caused by cancer of that organ, and it appears doubtful whether the more extended operation is warranted by any adequate benefits that can be fairly promised to the patient. When we take into consideration the great mortality which has followed extirpation of the tongue in its strict entirety, involving as it does either division of the lower jaw or the extensive submental incisions of Regnoli, with a mortality in the former instance of little short of 50 per cent., and in the latter certainly 25 per cent., it requires a full belief that cancer of the tongue may be local in its origin, and curable by removal, to justify the major operation. Regulating our motives and actions by the stern facts gathered by experience, our operations for cancer of the tongue, as in cancer elsewhere, only aim at a mitigation of suffering, and a limited prolongation of life. With this conviction the galvanic écraseur can be recommended as answering every purpose for removal of the tongue.

One advantage over the knife which may be claimed for the galvanic écraseur is the amount of destruction the heat occasions to the structures contiguous to the part removed—an action which cannot fail to modify, for a considerable depth, the tissues which might also be infected with the disease.

A feature in the case recorded worthy of mention is the facility experienced in adjusting the écraseur wire by means of the forefinger of each hand, and the retaining of it *in sitû* until the screw of the écraseur is tightened. Various ingenious instruments have been devised to effect this object, but that the most successful of these instruments can be proved as reliable as the finger has yet to be demonstrated. The finger can not only apply the wire, but it can ascertain whether the adjustment is correct; or if in fault, remedy the mistake before any irregularity can be committed.

The speed at which the screw of the écraseur is turned is of importance, so far as the prevention of hemorrhage is concerned; and the best rule to follow is—the less the resistance the slower the speed, and *vice versâ*, the resistance being in an inverse ratio to the vascularity.

It is the custom of some surgeons not to administer chloroform before the écraseur has been tightened so as to fix the loop around the base of the tongue, with the belief that up to this point there is but little pain, and that the voluntary efforts of the patient materially assist the surgeon. On the other hand, it is asserted that when voluntary assistance is of the most use, the pain caused by manipulation is the greatest, and that after the écraseur is firmly tightened the pain is diminished. Consequently, it is much to be preferred that the patient should be thoroughly under chloroform from the first, when the absence of resistance will be at least equal to any assistance the patient could afford were he not unconscious.

Fig. 1, Galvanic Ecraseur; *Fig.* 2, Side view.—The accompanying electrotype conveys a full representation of the several parts of the galvanic écraseur, as made by Messrs. Krohne and Sesemann. The instrument consists of four separate and separable parts:—*a*, the handle; *b*, a screw on which travels a clamp (*h*); *c*, canulæ through which the wire passes; *d*, platinum wire loop; *e*, ivory "interrupter" to connect or break the galvanic current by slight pressure of the thumb; *ff*, sockets into which the canulæ can be fixed by screws; *g*, receptacle for con-

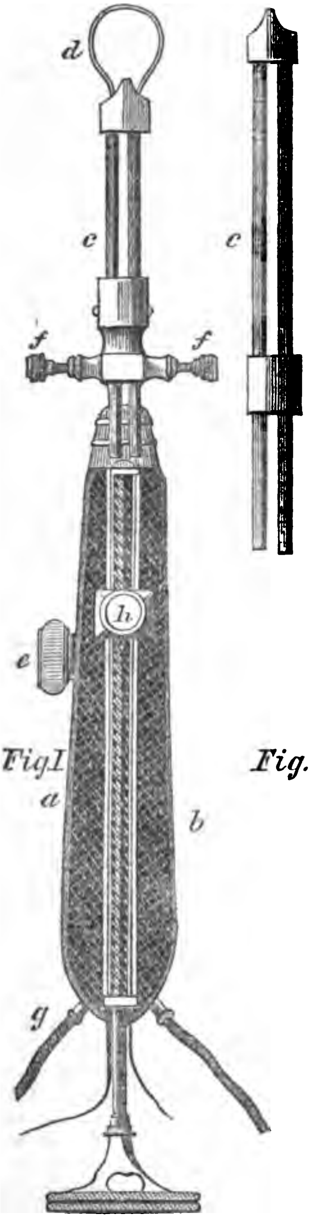


Fig. 1

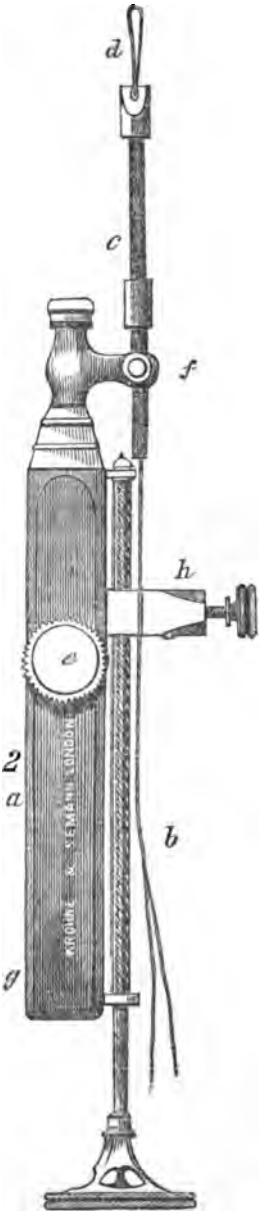


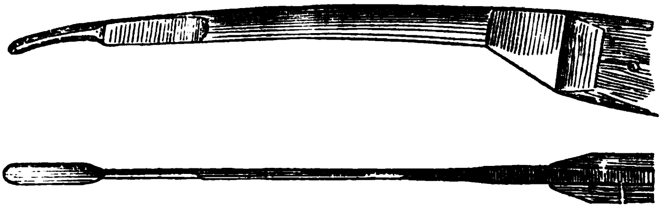
Fig. 2

necting wires from battery; on the long screw (*b*) rides the clamp (*h*), between the jaws of which the ends of the platinum wires can be fixed by a screw.—*Lancet, Feb.* 8, 1873, *p.* 198.

48.—A NEW HERNIA KNIFE.

By Dr. Alexander Patterson, Surgeon to the Dispensary, Royal Infirmary, Glasgow.

J. M., aged thirty-one years, admitted 7th October, 1872. Patient has suffered from rupture for some months back. Two days ago the bowel came down, since which time it could not be returned. He now labours under strangulated oblique inguinal hernia on the right side. Patient vomits, as he says, "what should go the other way;"—complains of pain radiating from the umbilicus—while the tumour itself is tender, with slight redness over its neck, probably from the application of the taxis outside. M. was put under chloroform, and the operation performed under the carbolic spray. Bowel, to the extent of two feet, was found in the sac, and the stricture was formed by the external ring, a situation at which it is rarely met with in a patient so young—while in old persons and old ruptures it is the common seat of stricture. 8th. Dressed, looking well, only there was œdema of scrotum which was elevated. 11th. Changed to-day. Œdema nearly gone. 13th. Dressed; œdema gone. 18th. Wound quite healed; sutures removed. Dismissed on the 26th October. This was my 34th operation for strangulated hernia, and at it, as in the five cases immediately preceding, I used the knife which you see here; it differs from Sir Astley Cooper's, simply in the blunt pointed part of the knife having a quarter turn given to it, so that the flattened point passes more readily under the stricture, while its breadth flattens and pushes the gut aside as the cutting part of the blade follows. In femoral hernia especially, the stricture is much more easily cut than with the ordinary knife. I have opened the sac in all the cases in which I have been called upon to operate, as being the safest mode for the patient. Although the stricture is usually external to the sac, yet the neck of the sac itself may form the stricture, adventitious bands may remain inside, and, as length of time is not an absolute criterion as to the state of the contents of the sac, but rather the tightness with which the bowel has been caught, you cannot, with certainty, tell when to open the sac, and when to leave it unopened. I have seen the gut safe after a week's strangulation, and in other cases black in a number of hours, the latter especially in femoral ruptures. Besides, after all, it is not the operation which kills the patient, but the delay which has taken place before you see the case. The proper way to act when called to a case of strangulated hernia is, I apprehend, to explain the nature of the case to your patient, put him or her under chloroform, try the taxis, and failing reduction, be prepared to operate at once. If you have a blush on the skin over the tumour, omit the taxis, and operate immediately, if the patient's strength will admit. It is, in my humble opinion, great folly to waste precious time in administering purgatives and injections, and waiting for their action. The only cases in which delay is at all admissible, are the large old herniæ, in men advanced in years, in whom the circulation is slow, the stricture at the external ring, and the strangulation rarely very tight, and consequently where there is less risk of gangrene. In such cases, large injections, thrown up, so as to distend the lower bowel, and be ejected immediately, with the application of ice to the tumour, afford a fair prospect of success.—*Glasgow Medical Journal, Feb.* 1873, *p.* 187.



49.—ON HEMORRHOIDAL AFFECTIONS.

By Christopher Heath, Esq., Surgeon to University College Hospital.

[It cannot be too strongly insisted on that the rectum should be carefully examined in these cases—first with the finger, and then, if necessary, by sight. If the patient is a female, she should lie on her side in the ordinary obstetric position, and the finger may be passed into the vagina as well as into the rectum, as the rectum may often be better examined from the vagina, particularly in cases of stricture.]

If a minute examination is desired, a speculum may be employed. You may use the ordinary glass speculum, with the end cut off obliquely, or one that is not truncated. Perhaps the most convenient and simple one is a metal one, that can always be kept bright. There is a plug inside to facilitate its introduction. Of course, when examining the rectum, the plug must be taken out, and the mucous membrane then falls in. In withdrawing it, if the end is not open you are apt to nip any pile that may exist and to produce a good deal of pain. Therefore an important point is, to pass the finger into the speculum and push out any portion of mucous membrane that may have prolapsed into it. The instrument will then come out easily enough.

There is, however, quite another form of speculum, and one that is perhaps the most convenient of all. It is the bivalve speculum, being formed of two parts connected by a simple hinge. It has this advantage, that you can fix it open at any point, and then you can readily introduce your finger to examine any part, the speculum being turned round in any direction. Of course, in any examination the great object is to make it with as little pain as possible, and yet with perfect efficiency.

Disease high up the rectum may be seen by means of the endoscope, an instrument not in very common use. I show you one here. The lamp is shut up in the box, and the light from it is reflected by a mirror down the tube, which is introduced into the rectum. Looking through a perforation in the mirror as through the hole in an ophthalmoscope, you are able to see the mucous membrane in the lower end of the tube lit up by the rays of light thrown from the oblique mirror.

One other point with regard to examination of the rectum. It is well to examine it digitally, and also with instruments, but a confident opinion about diseases of the rectum cannot be given unless an enema is administered. This is a most important point. Let the patient get rid of the enema in the ordinary way and strain, so as to bring down anything that will come down, and then you have an opporuntity of seeing what is the real state of the lower end of the bowel. Piles, polypi, and other diseases may be overlooked unless this precaution is taken.

With regard to hemorrhoids, commonly known as piles, let me say that there is not necessarily hemorrhage. You may, of course, have bleeding piles, but you may have blind piles, and you may have external or internal piles; but all are classed together as hemorrhoids. The blood-supply of the rectum, I need hardly remind you, is from three sources, the superior, middle, and inferior hemorrhoidal vessels. I have here Mr. Quain's work on the Diseases of the Rectum, the plates in which may serve to remind you of the anatomy of the parts. The connexion of the upper hemorrhoidal vein with the vena porta is important, because it explains the occurrence of piles in persons in whom the portal circulation undergoes any obstruction. In organic disease of the liver, or in any tumor pressing on the portal vein, we are sure to have venous obstruction in the rectum. Hence we get formed a hemorrhoidal tumour, a venus hemorrhoid. Such tumour may be internal or external; more commonly it is internal, and in the form of an elongated vein, such as is well represented here in Mr. Quain's plate. If the veins get large they may protrude from the rectum as a large purple vascular mass, really an internal hemorrhoid becoming external. That is an important point, and to be insisted upon, because the treatment must be for internal hemorrhoids; and, as we shall see, the treatment of the two disorders differs considerably.

Let us consider for a moment the subject of external hemorrhoids. When a distended hemorrhoidal vein becomes blocked up by a little clot, or by some inflammation around it, the result is that a little purple lump is formed by the side of the rectum. What becomes of such a hemorrhoid if you leave it alone? After a time, the inflammation subsides with or without treatment. It very seldom suppurates. The blood which was effused in the pile becomes absorbed, and, consequently, the skin which was distended by the blood is left loose, and hangs in folds about the anus. If this has been repeated a few times a person who is said to have had several attacks of piles gets a series of loose folds of mucous membrane about the verge of the anus, which folds give rise to a great deal of trouble.

We may dismiss this subject at once, for the treatment of external piles is a tolerably simple matter. You see a little purplish mass outside the anus; all that you have to do is to make an incision into it, and squeeze out the clot. The incision should be made in a direction radiating from the anus. The clot is either in a vein or in a little cyst; it is a disputed point which. Let out the little clot, put a poultice on, and in a day or two the thing subsides, relief being given at once from all the sharp pain which existed before. If you do not thus interfere, you run a risk of suppuration, or of the formation of the troublesome loose folds.

The proper treatment for the loose folds about the anus is to cut them off. You can never do any harm, provided you are careful not to do too much. Pick them up, and snip them off in a direction converging to the anus. Do not do too much, for the reason that if you do a stricture of the anus may be the result. Every now and then one sees a patient who has been submitted to this heroic treatment, and who has got, as a consequence, stricture of the anus—a most painful complaint, which is practically incurable. So much for the subject of external piles.

Internal piles give rise to a sense of weight and discomfort if they are simply blind piles, but if they are bleeding piles, in addition there is loss of blood. The hemorrhage may be simply venous, and if so it is of no great moment. It is no doubt due to some pressure on the portal vein, and it may be salutary in one sense—it may relieve the engorgement of the internal organs, and if slight it is perhaps better not checked. If you find, however, that the patient is losing arterial blood it is another matter. It is a mistake very commonly made to suppose that the hemorrhage from piles is necessarily venous; it is by no means so. Sometimes the patient goes to the closet and finds a considerable quantity of arterial blood is evacuated, that it comes in gushes from the anus. Under these circumstances the patient becomes much reduced, loses blood in a way which the system cannot support, and may actually die from loss of blood from bleeding piles, though fortunately now-a-days this is rare. Loss of blood in excessive quantity is much more apt to occur and to be concealed among females than among males, both because the patient does not like to complain of it, and because the doctor sometimes is not careful to inquire about it. The patient is seen to be anæmic, and the anæmia is treated without any investigation being made into the cause of the affection, whether from bleeding piles or otherwise. Always, therefore, in such a case, inquire whether there be loss of blood from the rectum. Of course this may occur as vicarious menstruation, cases being met with now and then in which discharge from the rectum regularly recurs, month after month. With such
uld probably not be advisable to interfere until the normal discharge
blished.

g may occur from within the bowel, even though nothing ever comes
he patient simply loses blood, and can tell you nothing more about
ng the finger into the bowel, it may often be found that there is a
lvety feeling about one side, and on withdrawing the finger it is seen
d with blood. On introducing a speculum, and examining the spot,
d that there is a vascular-looking portion of the mucous mem-
re like red velvet than anything else, from which the blood is
is the condition it can readily be cured. It is in these cases
ch good. Apply the acid upon a stick through the spe-
urface tolerably freely, care being taken to prevent the
parts of the mucous membrane. One or two applications

1.
tive
lay in
whom
lation ra
In such ca
be ejected 1.
prospect of su

will often cure the case altogether. Usually, in addition to the loss of blood, with the straining there comes down a great mass of piles, originally internal, now external, all being thrust through the sphincter. From certain portions of the mass, usually the upper parts, which have this peculiar red appearance, blood exudes. These are cases in which more radical treatment must be adopted. You may, if you like, touch them with nitric acid, and a few years ago it was recommended as an panacea for all rectal disease. No doubt by it the hemorrhage may be controlled for the time being; but you will not cure the piles, and the probability is that in a very few months the patient will again suffer from them, and perhaps also from the bleeding. Yet I occasionally use nitric acid for one single pile, especially in women, on the perineal side of the rectum, when the small vascular growth can be almost destroyed with one application of nitric acid; but I do not employ it for anything like a large spongy mass from which blood exudes, the delicate skin of the anus being everted and swollen and protruded by the side of it. I am particular about calling attention to this last, because it is very important with regard to treatment, since it must not be interfered with too freely, or a stricture is likely to be produced.

Given a case of that severity, what mode of treatment is to be recommended for it? The older surgeons used to cut off these piles. Dupuytren was exceedingly fond of doing this, and he cut them off with some success, but had many fatal cases simply from hemorrhage. You will find in his "Leçons Orales," that he had lost several patients, and that in other cases he had great difficulty in stopping the bleeding. I need hardly say that such a state of things is not desirable, and would be sufficient to warrant one in finding some other method. Brodie was the first to use the ligature. He says in his Lectures that he happened to come across a lecture of Mr. Cline's, in which he decried the ligature, and said that only timid surgeons would use it, and that there was no harm in cutting the piles off. So Sir Benjamin Brodie adopted for a short time the practice of cutting them off; but he found that he lost a patient from hemorrhage. Sir Astley Cooper did the same, and lost one or two patients from bleeding into the rectum. Now-a-days I think no surgeon would think of cutting away internal hemorrhoids without taking the most effectual means to arrest the hemorrhage. In the great majority of cases the ligature is the most effectual means. Holding up the pile with forceps, you may put the needle through the base of one pile and tie it in two parts, and then treat the other masses in the same way. After a few days, when the parts have healed, there will be a complete relief to the ailment. But it is a very painful mode. You cannot help including some of the delicate skin of the anus, which is so well drawn in the figure in Mr. Curling's book. The pressure of the ligature in ulcerating through that gives rise to great distress; therefore it was that Mr. Salmon, who had a large experience in diseases of the rectum, proposed his plan. The hemorrhoidal vessels enter the pile at the upper part, and therefore there is no danger in cutting at the lower part, where skin and mucus membrane join, so long as you take care to leave at the upper part the vessels untouched. Accordingly, instead of simply tying the pile, he cut between the mucous membrane and the rectum with a pair of scissors. Thus he isolated the pile from the delicate skin, and applied the ligature to the neck of the pile. That is the operation I ordinarily perform when I apply the ligature. The instruments required are simple. First, to get the pile down, the patient must have an enema, and strain. Then you grasp it with a pair of pile forceps, or, if you prefer it, with Salmon's hook, which answers exceedingly well, slipping the instrument into the anus, getting hold of the pile, and drawing it down. Taking a pair of curved scissors, you snip at the line where the mucous membrane and the skin join. Having dissected up the pile in that way, then carry the ligature round the base of the pile, and tie the essential part of the pile in that way. Having done that, and thus secured the vessels, you may safely cut off the part you have isolated, within a reasonable distance of the ligature. That is the advantage of this modern operation: you can cut off the piles and get rid of them, instead of allowing them to slough away, much to the distress of the patient. Probably two or three piles will need separate treatment thus. The ligatures will probably come away at the end of a week, according to the thickness you have tied. In a few days more the patients are perfectly well and comfortable, and relieved. It is a satisfactory point to remember that if you operate on a couple of piles in the rectum in that way, although you have not destroyed the whole of the disease, the influence of the ligature and of the ulcerating and healing process is such that the patient is practically cured of his disease. Let me remind you that the operation is not finished if you have any loose folds about the margin, to which I have already referred. They should always be chipped off, though not to the extent of producing stricture of the anus.

Another method of treating piles which has been much cried up in modern times is the method with the clamp. The original clamp was an invention to be used in connection with nitric acid. The late Mr. Houston of Dublin, Mr. H. Lee, and others, have been in the habit of clamping the pile, cutting it off, and applying nitric acid. That was a tolerably effectual method, but it had its drawbacks. Mr. Henry Smith improved the clamp, and made it a useful instrument in certain cases. Its object is to take up the pile or mucous membrane, and, with a screw in the handle, to compress it. You then cut off the pile, and sear the cut surface with a small cautery, so as to stop all hemorrhage. It answers well for slight cases, where you have loose mucous membrane, and not great masses of piles, and especially in those cases in which you have an opportunity afterwards of watching for hemorrhage. I never operate in this way upon cases which are bad or are at a distance, because there may be hemorrhage afterwards. It does not often occur, but it does sometimes. If a ligature has been left on you know that hemorrhage cannot occur, and that you may trust the patient at a distance from the surgeon. Another little drawback in the clamp is, that the greatest power is exerted at the hinge, which is at the anus. The critical part, where the vessels are, is apt to slip out of the grasp of the blades. To obviate this difficulty, Mr. Gowlland, who has had great experience in diseases of the rectum, invented a clamp which acts on a similar principle, but instead of applying it from below upwards, as Mr. Smith's clamp would be applied, it is intended to be applied from above downwards. The hinge against which the pressure is being exerted is at the upper part, where the vessels exist. My colleague Mr. Scott has also contrived a clamp of the same kind, in which the screw is retained instead of the spring catch of Mr. Gowlland's instrument. No doubt these are safer clamps, but are more difficult to apply, and therefore, for slight cases, I generally use Mr. Smith's clamp, while for more severe cases, I prefer to use the ligature.

The after-treatment is simple. Give a suppository at the time of the operation, or give an injection of opium. Keep the patient quiet, and keep the bowels confined for a few days. On the third day give a little castor oil or some mild purgative, and let a bread-and-milk poultice be applied to the anus for a few hours after the first action of the bowels, which is always painful. Afterwards keep the bowels regular: and in a few days the patient will be well of his malady. If you have had to take away some pieces of loose skin, a few days longer will be required, and the application of the dilute nitrate-of-mercury ointment will be beneficial. You may safely promise the patient relief from all his troubles in ten days or a fortnight. I have had many cases here which have done exceedingly well with both methods of treatment.—*Lancet, Jan.* 18, 1873, *p.* 82.

50.—ON POLYPUS OF THE RECTUM, PROLAPSUS, FISSURE, AND FISTULA IN ANO.

By Christopher Heath, Esq., Surgeon to University College Hospital.

Polypus.—Patients not unfrequently complain of piles or prolapse of the rectum when really affected with polypus. In children it is not uncommon, and is a cause of bleeding from the bowel. Piles are rather uncommon in children; and if a child is brought to you with bleeding from the bowel, you are very likely to find in the rectum a little fibro-cellular polypus. I have a drawing here of one with a long pedicle. It is a simple matter when once made out, and may be removed with safety to the patient. If small, in children, it may be broken off with the finger and no hemorrhage result; but if large, and in an adult, it is safer to ligature the pedicle, and there is no difficulty in the operation. Draw the polypus down and apply the ligature, cut off the pedicle near the polypus, and you will have no further trouble about it. The patient in a few days will be completely relieved of his distress. I have operated myself in that way repeatedly, and have never had any trouble.

Prolapsus Ani.—Another disease which you often find confounded with ordinary hemorrhoidal disease is prolapse of the rectum. Here is a drawing showing a portion of mucous membrane largely prolapsed. I may say that we can draw a distinction between prolapse and procidentia just as we can with regard to the uterus. By prolapsus we ordinarily mean simply the mucous membrane prolapsing. It may be hemorrhoidal or not; in many cases it is so. By procidentia we mean the whole rectum coming down: all the coats, the muscular and it may be the peritoneal coat also. In such cases it would not do to cut off any part of the bowel. Yet this has, I am sorry to say, been done once or twice, and the peritoneal cavity has been opened.

I will not now consider those extreme cases. I will confine myself to-night to the ordinary form of prolapse which occurs in children and elderly people. In children it is commonly the result of straining; in elderly women it is generally the result of weakening of the perineal structures, when, on some exertion, the bowel descends. Obviously, such cases should be distinguished from the more severe cases of prolapse of the entire bowel. Passing the finger over the prolapse, we find smooth mucous membrane turned inside out, which can usually be returned by slight pressure. In children it is better to give chloroform; in other cases it is easily reduced without.

Treatment for the tendency to prolapse may be either palliative or curative. Palliative treatment consists of styptic injections into the rectum; or you can, if you choose, let the patient wear some kind of support—an ordinary bandage, or, what I think is very objectionable, one of the anal supports, a pessary thrust into the anus, and supported by a kind of sling or truss. A much better plan is to try and produce a radical cure, which may be done in two or three ways. In the first place, you may use nitric acid, applying it over the prolapsed mucous membrane. There is one danger against which you must be warned, and that is, the danger of producing a stricture. I have known that occur. What I prefer myself is, to use nitric acid in stripes down the prolapsed rectum, rather than to smear the whole surface. If you adopt the latter plan, four or five stripes are sufficient, and thus all risk of producing too much contraction is avoided. Another mode of producing a cure is to narrow the anus. In these cases we find the anus has become distended by the habitual enlargement; and if you remove some of the skin about the margin of the anus by scissors and forceps, in the way I have already mentioned when speaking of hemorrhoids, the parts contract in healing, and a support is given to the lower end of the rectum which practically cures the patient of his disease.

Fissure of the Rectum.—We will pass now to another subject,—namely, fissure. I may say at once that we see a great number of cases of fissure at this hospital, because it is more common among women than among men. Generally you find that the patient complains of great pain in the act of defecation. A woman came here this afternoon and complained that she had piles, and suffered great pain during defecation. I was pretty sure, however, she had not piles, because if she had piles, the pain would have been continuous. When examined there was a well-marked fissure at the place where it so often exists—namely at the posterior surface of the rectum. It is much more common at the posterior than at the anterior part. In these cases examination shows us at once the little ulcerated edges of a split in the mucous membrane. The passage of fæces in a case of fissure causes excruciating pain, and hence more or less spasmodic contraction, due, no doubt, to the irritation of the ulcer by the fæces.

What is the cause of the fissure? It may be simply mechanical. The patient has had constipated bowels, and in passing the motion the mucous membrane was a little torn. A certain amount of spasm of the anus was the result, and when the next motion passed, the irritation was again repeated. The anus was never quiet, the fissure never allowed time to heal, and consequently, there the fissure is. Or a fissure may result from some slight tear of the part during parturition. Or it may have arisen in another way: an ulcer in the lower part of the rectum may extend downwards through the sphincter, which keeps up constant irritation, as in the former case.

You may palliate, and sometimes cure, this affection by the use of simple remedies. The best plan, I think, is to use equal parts of belladonna and mercurial ointment, introduced by the finger of the patient twice daily, care being taken to keep the bowels from becoming costive. In this way many slight cases may be cured. If it is a bad case, however, it is better to adopt some more radical treatment. One method is the forcible dilatation of the anus with the two thumbs or fingers, as originally recommended by the French surgeon, Recamier. You thus tear open the fissure and also a few fibres of the sphincter, and to some extent paralyse the sphincter, and then, traction upon it ceasing, the ulcer soon heals. The dilatation may be followed by the application of some simple ointment, and in many cases a perfect cure results. Of course it is painful, but it has this advantage, that it does not lay the patient up. At the same time, I may say that you must not expect too much, and you must be careful not to do too much. One patient, I remember, in whom too much was done, had ever afterwards some little incontinence of fæces. So it is important not to be too vigorous.

A more surgical proceeding is, no doubt, to divide the fissure with a straight bistoury. Pass the finger within the anus, get the finger close against the ulcer and against the fissure, and then introducing the knife flat upon the finger, turn the edge against the fissure, and draw it gently out. In that way you cut the whole length of the ulcer. It is not necessary to cut deeply; a few fibres of the sphincter alone need to be divided. A few days' rest in bed and syringing out of the rectum, every trouble may be relieved, and the patient speedily be well. That is a much simpler measure than the plan originally suggested by the French surgeon, Boyer. He introduced a bistoury into the anus, and cut boldly through the rectum and sphincter into the ischio-rectal fossa. Such a cut took long to heal, and did the patient considerable damage. To the late Mr. Copeland and to Mr. Quain is due the credit of showing that all the good effect of the operation could be gained by the slight cut I have already described, and in the great majority of cases this is sufficient to cure the patient of his disease.

A little point which should be borne in mind is, that in the upper part of the fissure we now and then find a little protruding polypoid growth of simple granulation tissue springing up from the bottom of the ulcer. If that is left, a risk is run that the patient will not be cured. The growth may be clipped away with scissors, or scratched away with a knife, without fear of hemorrhage.

Fistula in Ano.—I now pass on to speak of abscess in connection with the rectum, and also of the result of abscess—namely, fistula. Of course, you may have abscesses of various kinds, superficial or deep. A superficial abscess may be simply a suppurating pile. The deeper form, that which ends in fistula in ano, is an abscess by the side of the bowel. It is connected usually, or at least in most cases, with some perforation of the bowel itself — perforation either from a foreign body, as a fish bone, or more frequently due to a small ulceration just above the sphincter, through which some portion of the fæcal matter escapes. The fæcal matter, of course, acts as a foreign body in the loose cellular tissue of the ischio-rectal fossa, inflammation occurs, and the result is an abscess pointing externally by the side of the anus.

You will find that the pus which is discharged in these two classes of cases differs very much. If it is a simple abscess—an abscess arising from an injury, exposure to cold, a damp seat, or a suppurating pile—the pus is simple, like that of an ordinary healthy abscess. If, however, it is an abscess derived originally from the bowel, either by perforation of a foreign body or the perforation of an ulcer, you have that excessively fetid pus which is generally put down as characteristic of all abscesses by the side of the bowel.

The symptoms, of course, are those of an ordinary abscess—swelling, throbbing pain, gradual reddening of the skin, a tendency to pit. The sooner the abscess is opened the better, because, if it has not already perforated the bowel, if it be one of those abscesses which arise in the ischio-rectal fossa, it is very important to prevent it from perforating the bowel, which it is very apt to do if allowed to run its ordinary course. Therefore a free vent for the matter is of the greatest importance. In making the incision the best way is to use a good-sized bistoury, plunge it boldly into the abscess close to the anus, and make a cut radiating from the anus, so as not to injure the bowel in any way, and yet to make a good free vent for the matter. The after-treatment is that of an ordinary abscess. There is no question that an abscess of that kind, even if close upon the bowel, may be laid open without perforating the bowel. Unfortunately, in many cases, it is found that such perforation has already taken place, or that, if not already communicating, in process of time the abscess does perforate the bowel, and then we have a fistula in ano produced.

Fistulæ in ano have been described as of various kinds. In the first place there are two great divisions, complete and incomplete. The complete are those in which there is an external opening to the remains of the abscess, and an internal opening from that again into the bowel, usually just above the internal sphincter. The incomplete fistulæ are those in which there is an external or an internal opening only, and those fistulæ are named either blind external or blind internal fistulæ, according to the position of the opening. There is here a little contradiction in terms which it is well to be clear about. A blind external fistula is one which does not open at the inner end. On the other hand, a blind internal fistula is one that has an opening into the bowel, but which does not open externally. A blind internal fistula is no doubt very rare. When I say very rare, I mean compared with a complete fistula, or with an external blind fistula. But it is more common than many people suppose, and you will find, every now and then, that by examining the lower portion of the bowel you can feel a little opening, and by bending a probe you can hook it into the opening of the blind internal fistula, and by pushing the end down you can make it protrude the skin by the side of the anus, and show that there is an opening or communication between the bowel above and the abscess below. I mention this particularly because it is a form of fistula which is very apt to be overlooked. I may say at once, in order to dismiss the subject, that the proper treatment is to convert it into a complete fistula. Cut upon the end of the probe, and if it does not heal up at once, treat it as you would a complete fistula—lay it open into the bowel.

With regard to external fistula, the ordinary form, there has been a variety of views concerning the question of the internal opening. Sir Benjamin Brodie laid down the rule that there always was an internal opening, but that is not quite true. In the great majority of cases, no doubt, there is an internal opening, although you may not be able to find it in all instances. We meet occasionally, however, with cases in which we can prove to demonstration by dissection that there is none.

There is a difficulty with regard to the internal opening which I may illustrate with a rough diagram. Take an imaginary section of the bowel. Here we have the track of the fistula passing up for some distance with the internal opening at the top, above the internal sphincter. The abscess has perhaps burrowed further, and opened up a track alongside the bowel; and then, in the examination of the fistula, the probe is passed unconsciously beyond the internal opening, and often for some distance beneath the mucous membrane of the bowel, as is felt by the finger introduced into the rectum. Of course it does sometimes happen that another opening has formed there; for unquestionably there are cases in which you have two internal openings. It is then very important, most important, that in dividing the fistula you should not merely lay it open as far as the upper opening, but should also divide the original *bona-fide* internal opening, which is generally to be found close above the internal sphincter. If you get the probe in here you at once feel it; if not, take great care in drawing the knife down that you try to hit it. It is no doubt the explanation of many cases of unsuccessful operation that the internal opening has been overlooked.

The operation itself is simple. The old surgical operation was a brutal proceeding. It consisted in cutting out the fistula, and even nowadays, I am told, patients may be seen whose fistulæ have been cut out. It was a perfectly unnecessary proceeding, and of course great damage was done; the sphincter was cut away considerably, and the patient was left in a much more wretched state than before. The great thing is to lay open the fistula into the bowel. This you can do by passing a probe-pointed bistoury up the fistula and putting the finger into the rectum; then with the finger in contact with the end of the bistoury, draw it down. Perhaps a more simple mode is to use a probe-pointed director, which you can guide steadily up through the fistula to the finger which is in the rectum, and, having met the finger with the probe point of this, you then bend down the point, and with a little manipulation, the parts being lax in the living body, you are able to push the director through the opening, bending it a little so as to bring the extremity out at the anus. All that is then necessary is to run a sharp-pointed bistoury along the director, and to lay the fistula completely open. Either way answers very well: it is a matter of taste which you choose.

Having laid open the main fistula, it is of great importance to examine most carefully in a good light for supplemental fistulæ; because these are too often overlooked, and it is found that the patient on whom the operation has been performed does not get well, and leaves the hospital uncured, and finally has another operation performed before a permanent cure is effected. The explanation is that there is another fistulous track at one side. On cutting the fistula and laying it open into the bowel, perhaps half way along it you find another opening leading out in another direction; and if that is overlooked, the result is that you will not cure the patient. Examine very carefully then in each direction, and lay all supplemental fistulæ freely open. I do not advocate more cutting than you can help; but you must lay all open to do good. The only caution with regard to the female is, that if you cut very close upon the junction of the sphincter ani and sphincter vaginæ you are very apt to get some incontinence of fæces afterwards. You cannot always help it. The sphincter is slow to return to its normal condition, and it may take many months to get over it.

Another point of great importance is to treat the thickened loose corners of skin which are badly nourished and prevent the part from healing. One of the greatest improvements, I take it, of the modern treatment of fistula is the cutting off of these corners of loose skin. It is a practice, followed first in St. Mark's Hospital in the City-road, and I have since adopted it myself with great advantage. It is no return to the old operation of cutting out the fistula. You simply take up the loose undermined corners of skin, and cut them off with a sharp pair of scissors. Thus you save time. The parts beneath begin to granulate up at once, contract, and heal rapidly, and so you may often cure a patient in a few weeks who, if the corners had been left, would not have been well for a month or two. There is of course a little hemorrhage, but the parts have become indurated, and the vessels at the lower part do not bleed very freely, and they are easily controlled with a little plugging. In the part of the fistula represented here [diagram referred to], running up by the side of the bowel, there is, no doubt, danger of hemorrhage. I have seen sharp hemorrhage from the division of such a fistula high up, and perhaps the best way to avoid it is not to use a knife in that upper part of the bowel, but a pair of scissors, as recommended by Mr. Allingham. Pass a director along the mucous membrane, and with a pair of scissors lay it open through a speculum, slitting it up. It is well afterwards to plug the opening carefully with cotton wool, so that there should be no hemorrhage. After some days' rest it will come away gradually, and will have prevented hemorrhage and all trouble. The best after-dressing of a fistula is to leave it alone. Daily stuffing it with oiled lint is a labour most painful to the patient and troublesome to the surgeon, and fulfils no object whatever. Do not allow the edges of a divided fistula to unite at once, but after twenty-four hours there is not much danger of that. Keep a little oiled lint or cotton wool within the edges for twenty-four hours, and leave the parts alone afterwards. Keep the bowels locked for a day or two, and then give an enema and clear them out. Afterwards keep the bowels regular, and every now and then have a little red lotion injected into the fistula.

There are other modes of treatment of fistula besides the knife which deserve mention. You may divide a fistula with the ligature if you choose. The high fistula is that which is best treated in that manner. A wire ligature may be used, or the special instrument devised by Mr. Luke some years ago. The treatment by the ligature has been rather quacked, that is the misfortune. "Treatment without cutting" means treatment by the ligature. It is a much longer proceeding, and, unless for some special reason, I should always have recourse to the knife.

There is no question about operating on patients subject to phthisis. No doubt there is a tendency among phthisical persons to suffer from fistula of the anus; and the question commonly arises, Ought they to be operated upon? It does not do to lay down the law too broadly. If it is a case of early phthisis, and the fistula is a source of annoyance to the patient, I should decidedly operate. If, on the contrary, the lungs are riddled with abscesses, and the patient is going into the last stage, it would be madness to think of such a thing. If you did, the sinus would not heal up, and the operation would simply add to the patient's discomfort. In early cases it is different. The fear of throwing the disease upon the lungs has almost died out, and we no longer hesitate to relieve a tolerably healthy patient from a troublesome and depressing malady. A young man decidedly phthisical, on whom I operated two years ago, has just returned from the Cape with the fistula perfectly sound.

Pruritus Ani.—We come next to an affection which is very troublesome both to the patient and to the surgeon—viz., pruritus; troublesome itching about the anus. It may arise from various causes. No doubt indigestion is a frequent cause, the patient having eaten food that disagrees with him. Or it may arise from local causes; and if this is the case, so much the better for the surgeon, because he can probably get rid of them. Ascarides—the ordinary thread worms—will sometimes set up intolerable itching about the anus; and it is a mistake to suppose that you do not meet with them in the adult. The treatment is simple: get rid of them by some injection of quassia or common salt, and you cure the patient. But it may also arise from other causes which may be got rid of, as for instance, pediculi pubis, familiarly known as "crabs," which creep to the anus, and keep up the irritation in the same way as do the ascarides. They are readily got rid of with mercurial lotion.

The cases in which there is no local cause and yet intolerable itching are much more difficult to treat. The most important things are to attend to the general health and to use sedative applications to the anus. The greatest cleanliness must of course be insisted on. Piles are sometimes a cause of pruritus. You may find the anus and the parts about irritated by constant scratching. As far as I have seen, they present no marked peculiarity. I notice, however, that Mr. Allingham, in his recently published book, calls attention to the absence of pigment as being a pathognomonic sign of pruritus ani. It may be so, but I have not myself remarked it. He says that if he finds patches of white skin slightly discoloured in the neighbourhood, he is perfectly sure that he has a case of pruritus ani to treat. Unfortunately the universal experience is that pruritus is most difficult to treat, and you may try every variety of sedative lotion or ointment without giving your patient much relief. I think I have seen benefit from the use of a lotion containing borax and vinum colchici, of each one ounce, in a pint of decoction of poppies, but I should be sorry to say that this was infallible.—*Lancet, Feb.* 22, 1873, *p.* 262.

51.—TREATMENT OF PRURITUS ANI.

[A correspondent, W. B., of Bradford, writing to the Lancet, says:]

At the end of Mr. Heath's lecture on Diseases of the Rectum [see preceding article], he says that "the universal experience is that the pruritus (ani) is most difficult to treat, and you may give every variety of sedative lotion or ointment without giving your patient much relief." I have found so much satisfaction in prescribing for pruritus a weak solution of carbolic acid (1 in 96 or

100) that I hasten to suggest this as a most valuable addition to our stock of remedies for this troublesome complaint. There is no application I know of so instantly beneficial in relieving the itching soreness which affects some persons after an evacuation.

[Dr. JAMES THOMPSON, of Leamington, writes to the Lancet, as follows:]

I have prescribed with much benefit carbolic acid, as your correspondent has done; but the mode of appliance was different, and in my cases much more effectual than the lotion. I direct the sufferer to place a small plug of marine lint in the anus every night, so that a small portion might be caught by the external sphincter to keep it in position; the remaining part forms a pad outside, keeping the parts from contact. In every case much benefit was the result. I commend this ready means of applying carbolic acid to surgeons in similar cases.—*Lancet, March* 8 *and* 15, 1873, *pp.* 364, 399.

ORGANS OF URINE AND GENERATION.

52.—ON THE INFLUENCE OF RENAL DISEASE ON THE CHOICE OF OPERATION FOR STONE IN THE BLADDER.

By Sir HENRY THOMPSON, Surgeon to H. M. the King of the Belgians, Professor of Clinical Surgery in University College Hospital.

When stone in the bladder coexists with any disease of the kidney, how does this influence the decision in regard to operative proceedings for the former?

1. I must first define what is to be understood here by the term "disease of the kidney." It is a comprehensive one, and is apt to be employed somewhat loosely. It embraces, of course, all the morbid affections to which the kidney is liable. These I shall endeavour to classify in a broad and general way; and in doing so will put aside as obviously foreign to the subject in relation to operative measures, the malignant diseases of the organ.

(*a*) Those chronic changes in the kidney structure associated with constitutional cachexia, of which they may be more a local expression than a cause, and which are comprehended under the term "Bright's disease," form an important proportion of the maladies in question. In the dead house you know that we meet with kidneys differing very much in appearance, size, and structural characters, all yet furnishing examples of different kinds of Bright's kidney, or, in some cases, of different stages of the same kind of disease. Most are included under the distinct types of "the granular contracted kidney," like that of our patient, and "the large, smooth, white kidney." Not to overlook a much more rare condition, I just name the "lardaceous" or so-called "amyloid" degeneration. Now the symptoms which denote Bright's disease are, for the most part, sufficiently clear and distinct during life, as you know; and the amount or stage of disease is, within certain limits, fairly calculable after some knowledge of the patient.

(*b*) Another kind of change which is wholly distinct from the foregoing occurs in kidneys which are either frequently or for a considerable time the seat of calculus.

The presence of minute foreign bodies, for the most part aggregations of uric-acid crystals, in the uriniferous tubes, at their orifices and around them, in the calices, is a cause of injury to the structure affected in a degree corresponding to the duration and the magnitude of the deposited matter. Any degree of injury, from a circumscribed and temporary inflammation of the lining membrane of the pelvis caused by a large quantity of rapidly formed crystals, up to almost entire destruction of the organ from the presence of a large renal calculus, may be observed. Happily, the latter condition is rare. On the other hand, the former is very common. I doubt whether any man passes much concrete uric acid for a few months without some little damage to the kidney. Certainly, during the process blood is almost always to be found in the urine by the microscope; and it must be inferred that when the habit of passing periodically uric-acid calculi has existed for some years, a certain degree of permanent deterioration has been suffered by the kidneys. There, are no other special signs of this condition. The patient's general health is often very good. There is no cachexia as in the class of diseases (morbus Brightii) just referred to. On the contrary, the patient is often hale and hearty in appearance. The characters of the urine are good; quantity abundant: specific gravity full average; no albumen, but urates often in excess and blood-discs are present, insufficient to affect the naked-eye tint of the urine. Pain about the renal and sacral regions and the hips often complained of. But I have frequently remarked to you that such patients often exhibit considerable febrile phenomena on instrumental interference, and that, although they look so well, more than ordinary caution is necessary in dealing with their calculi.

(*c*) I name, without further allusion to it here, saccharine diabetes, which cannot be passed over while considering renal diseases. To save returning to the subject, let me say that there is no question that for this and the preceding class, in which patients with vesical calculus are usually elderly, lithotrity is certainly preferable to lithotomy, unless the stone is large. The exercise of caution on the part of the operator to employ instruments as little and as gently as possible is essential. I have operated on two patients with success who were the subjects of marked saccharine diabetes, one of them within the last month; both were very sensitive to mechanical interference. A large number of elderly people with uric-acid calculus possess renal organs which have been subject more or less to prolonged irritation produced by the formation of small renal calculi; and when the degree is considerable, all operations on the bladder are more hazardous in consequence.

(*d*) The last class of renal changes which I have to consider are those resulting from diseases which habitually obstruct the outflow of urine. This affection also is not uncommon, and has an intimate relation to our subject.

Many years ago I described the process by which these changes occur. The principal conditions which originate them are, stricture of the urethra, enlargement of the prostate, large vesical calculus, and, less commonly, atony of the bladder. The order of enumeration is also the order of numerical frequency as a cause. Stricture always constitutes an obstruction to the outflow of urine commensurate with the degree of the narrowing. Considerable prostatic enlargement is a cause also, but notably less powerful than the preceding. Vesical calculus sometimes acts in the same way, but by no means as a rule; on the contrary, it is an exceptional circumstance when it does so, depending on certain conditions which vary with the individual, such as the habitual position it occupies in the bladder, its size, its liability to roll to the neck, &c.

This, however, is certain, that in cases of long-standing calculus, an autopsy will sometimes show only slight signs of renal changes produced by obstruction, while in another case those changes will be remarkable for their extent and degree. In no instance, be it remarked, do such changes occur apart from obstructed micturition in some form, and always of long standing.

The changes I refer to are dilatation of all the urinary passages behind the point of obstruction. Thus, in stricture of the urethra, we may observe dilatation of the urethra itself and its glands, protrusion of the mucous lining of the bladder through the interlacing fibres of the muscular coat, producing sacculi, dilatation of the ureters, of the pelvis of the kidney, of the proper renal structure, and thinning by pressure of the renal substance itself; so that the organ has the appearance of a series of cysts, which formerly was really supposed to be its pathological condition. I may refer to a work published in 1854, where the details were given by me with considerable minuteness of the changes which occur through the influence of fluid pressure. Let us consider for a moment the mechanical process by which this remarkable series of changes is effected. You know that hydraulic pressure is equal in every direction. Thus, if I make pressure on a flexible bag filled with fluid, that pressure is exerted equally at every point of the periphery; and if tubes are inserted, say in a vertical position at opposite sides, the fluid will rise and issue with equal force from each. Now, what happens in the flexible bag which constitutes the human bladder when obstruction exists in the form of stricture, enlarged prostate, or calculus? More force than natural is of course exerted to accomplish the act of micturition; the patient "strains," as he says, to pass his water, and sometimes, if the obstruction is considerable, the force exerted is very great. You see at once that this tells not only in the anterior direction upon the obstruction itself, but also on the ureters which enter the bladder from the kidney behind. Let us say that the ordinary pressure required to pass water in the healthy organs is one pound to the square inch (one number being, for the sake of illustration, as good as another), when obstruction is present the pressure may certainly be increased two, three, five times, or more. Further, the act of relieving the bladder, instead of occurring only five times in the twenty-four hours, and being speedily completed, may recur ten or twenty times, and the duration of the act may be greatly increased also. It is not necessary to explain to you how this state of things must act, and how that after a time (for the mouths of the ureters, not being so patient as the inner orifice of the urethra, do not easily yield to pressure) every act of straining tells on the passages, and dilatation advances by degrees until at last even the kidney suffers from the continued pressure and from the inflammatory process which necessarily accompanies it; for the ureters and pelves of the kidney may become supplementary reservoirs to the bladder, and are sometimes found filled with decomposed and ammoniacal urine. Long before this stage arrives inflammatory action invades these parts, a condition recognised, as you know, as pyelitis [diagram of dilated organs made]. By some this condition has been called "surgical kidney," a phrase which others have applied to denote the acute suppurative nephritis which sometimes closes the scene for a patient who has long had renal disease. I was glad to find Dr. Dickinson proposing at the Medico-Chirurgical Society to abolish so unphilosophical a term. It is one I never use and have a strong objection to. Why "surgical" kidney indeed? Certainly in one sense only—namely, that it is for want of surgical aid that the organs have come to the state in which they are. If that aid were rendered early in the history of the case, whether it be stricture or stone, no such condition would ever arise. Never was the proverb truer that "a stitch in time saves nine"—a surgical stitch, you understand. The pathological condition thus attained might well be termed "mechanical dilatation" of the ureter and kidney, as being mainly, although not entirely perhaps, produced by the physical process described.

Let me now inquire what are the symptoms which it produces during life? I know of none which are distinct and significant. I made this, I had almost said, humiliating admission, nearly three years ago at the Royal Medical and Chirurgical Society, laying much stress on the fact for the express purpose of inviting attention to it. I have long sought for some sign that should indicate the presence of extensive pyelitis and dilatation, but in vain. Such a patient presents no sign of change in the urine itself. It is of full specific gravity, abundant in quality, without albumen, except that which the presence of pus and blood accounts for, and such pus and blood are commonly found as vesical products formed by irritation from the calculus in cases where no renal disease exists. Whenever you have stone of more than small size you may have such products, and we are bound to expect them if the patient has any symptoms of cystitis, and some cystitis is always present in these cases of dilatation. Again, there is nothing which we can identify as disintegrated portions of renal tissue—no casts of tubes, nothing but pus and blood-discs—nothing, in short, distinctive. Then at no stage of the disease is there any dropsical effusion, no habitual dryness of the skin, not necessarily any marked feverish state, constant or intermitting. Nor is there any diminution of weight; on the contrary, the patient may have gradually acquired fat. But he is always, if the condition is advanced, in feeble health, is worn, and easily exhausted—signs which impress you with nothing so much as his obvious inability to bear any severe test of his physical powers, from all of which, however, nothing absolutely diagnostic can be inferred.

But it has been said, and with some plausibility, if the kidney is much damaged by disease, the urine will certainly show a deficiency of urea. Practically that is not so. Practically, with much pyelitis and dilatation, urea is sufficiently eliminated. Two half-kidneys, to speak roughly, will probably do the necessary elimination for the system in circumstances of quiescence, just as two half-lungs may suffice for a patient in very favourable circumstances; and failure to excrete urea is only manifest when the action of those two moieties of kidney is suddenly interfered with, by disturbance from external cold, &c., or by the inflammation propagated by means of an operation on the urethra or bladder. Practically, again, if I examine the urine of a patient in order to determine the amount of urea, and find it manifestly insufficient, is it not the fact that my patient must at that moment be to some extent in a condition of uræmic poisoning, and that he will certainly show some clinical sign thereof? Is not the fact that no such sign is present the only real proof that urea is sufficiently eliminated? Once the urinary constituents begin to be retained in the blood, the moment is at hand when symptoms of poisoning will appear. The chemical test alone must not be relied on in practice. When a patient passes abundance of urine of specific gravity 1018 to 1025, without casts, with no albumen except that which is due to the blood and pus found in the secretion, we have no ground for believing that any advanced organic renal disease exists unless we obtain evidence of its presence from other sources.

Now, I never operate for stone without first ascertaining whether the condition of the urine is that above described; so that if I undertake an operation for a patient manifestly the subject of renal disease, it is in full view of that fact, and because it may be absolutely necessary that surgical relief must be attempted at all hazards. Of this I have to speak by-and-by. No one would be more ready than myself to obtain further aid from chemical tests. I only fear that none are known which can aid us to demonstrate the presence of the mechanical dilatation to which I have referred.

Again, it has been said, Can you not by palpation or percussion demonstrate the existence of this disease? I answer for myself distinctly "No." A foreign authority demanding the utmost respect has recently affirmed that it is possible. With great deference, and after giving much special attention to the matter for some years, I emphasise my dissent on this point. I have long recognised this condition as one of the great stumbling blocks, perhaps the greatest now existing, in our way to diminish the mortality after operations for vesical calculi of large size. Had I any means of certainly ascertaining that a patient *with such a stone* had ureters and kidneys largely dilated, I would advise him not to submit to any operation, and I would do all I could to prolong his life and make it tolerable—a condition within certain narrow limits to be attained. Something may be done under these circumstances to accomplish this end—more, perhaps, than is often believed, of which I have seen some remarkable instances; but sometimes, it must be confessed, such palliative measures are useless, and the patient demands relief from sufferings which are intolerable, no matter what the risk may be. Can we under such circumstances humanely refuse him?

To return however: let us inquire what we can accomplish by palpation or percussion. First, I have determined the fact beyond all question, that there is by no means necessarily much, if any, tenderness in the regions of the ureter and kidney—that is, acute suppuration, active inflammation, or renal calculus not being present. You are accustomed to see how often I examine those regions in the wards. And you know how efficiently one may do it with a patient who is thin and spare; and also how particularly unsatisfactory is the examination when the patient is corpulent. Now the former condition is one you can by no means always reckon upon; on the contrary, I affirm that the latter condition must be more commonly expected in these cases. For a year or two, perhaps, the patients have been inactive, and fat has accumulated; and then you can learn little about the ureters by palpation. Again, the condition of the organs, even in the spare subject, offers no objective sign to physical examination. Let us suppose a ureter as big as the aorta, or larger still: is it a tube filled with air like an intestine which will give you a corresponding note? Is it filled with fluid, and will it thus give you a line of dulness which may be traced? By no means; it is a flaccid sheath with thin yielding walls, transmitting fluid, it is true, but you can no more isolate it by percussion from the adjacent structures, so as to demonstrate its size, than you can isolate by a similar process—let me say, the lumbar plexus. Of the kidney itself the same thing must be affirmed. You may, if fairly practiced, determine the solid mass of an enlarged kidney; but there is no way of demonstrating the existence of a dilated pelvis or of thinned kidney structure by any physical examination. No doubt you may guess—shrewdly perhaps sometimes; but it is no place or time for guessing when life or death hangs on the decision. There is a field here for further research; the door is open for investigation. For, you may rely on it, no method of arriving at anything like a certain diagnosis of pyelitis with mechanical distension is at present known.

2. But I have now to consider what influence ascertained disease of the kidney exercises on the prognosis, when the subject of it has also a stone in the bladder, and the question of operating for its removal has to be considered. Let me first say that when the stone is small—the size of a small nut,—whatever the condition of the kidneys, there is no very great risk from lithotrity if well performed. But it is by no means always that we are so fortunate as to find the patient with a small stone. It may be large, and do what you will the patient is in a position of danger; the only question for us is—by what treatment will that danger be least?

I have operated certainly in three cases in which advanced Bright's disease was known to be present, but in which the sufferings of the patient were so great that an operation was most desirable. In each the stone was phosphatic; in the first and second it was large, in the third of medium size.

The first was a gentleman whom I saw with Dr. Sharpe, of Norwood, in 1865. With extreme care I removed the whole in eight sittings, with great relief to the patient. His urine, although fairly clear, was of low specific gravity, and charged with albumen. The subsequent part of his life—I believe about six or nine months—was rendered comparatively comfortable. The second case was in this hospital in 1870. He was also handled with the utmost caution, having five sittings in ten weeks, owing to the severe rigors and prolonged fever which followed some of them; but he went out marvellously improved, and lost all his calculous symptoms. I saw him three months after, and he fully maintained all he had gained. I have heard nothing since.

The last of the three occurred about the same time, also in the hospital. His disease was more advanced than that of the preceding case. Only on his very urgent solicitation I consented to try lithotrity. I could not resist the appeal to diminish his suffering if possible; that he must die at no distant time both he and I knew. With his pallor, debility, and uniformly rapid pulse, lithotomy could not be thought of for an instant. I kept him three weeks before touching him, in the hope of improving his condition. Five sittings sufficed to remove nearly all the stone; but the last was followed by severe shivering and vomiting, and death in a few days.

Should I have done lithotomy in any of those cases? I answer unhesitatingly, in not one of them was it possible to submit, with any chance of success, men in such a feeble state to any severe cutting operation. Nothing but lithotrity could offer the slightest chance, and it saved two of them from the anguish of stone, and from the additional proclivity to death which it entailed.

But these, you say, were examples of known "morbus Brightii," and you naturally enough demand if I should be guided by the same principle in a case of mechanical dilatation and pyelitis if I knew beforehand that I had to deal with such a one? To this I can only say that the patients whom I have seen, and whose autopsies have demonstrated that they were the subjects of that condition, have been manifestly defective in vital power—patients for whom I should certainly shun a cutting operation of any kind if possible. Although, as I said on another occasion, had we the means of identifying an advanced example, I should gladly avoid either lithotomy or lithotrity, still I believe that I have employed the latter with success for a few. I have thus operated three times in cases of bad old-standing stricture of the urethra (maintaining the urethra well dilated by a catheter permanently tied in for the purpose, as you have seen), in which I have no doubt that considerable mechanical distension of all the passages existed. But these people were so miserably feeble that nothing would have induced me to cut them, nor do I think that any man would have ventured to do so.

But you may still rejoin, and you will be quite right in doing so, surely it has been said by surgeons of experience in the past, that when "renal disease" exists, it is better to remove the stone by one operation, although severe, than to attempt it by a process which requires repeated introductions of a lithotrite, and a more or less continued irritation from fragments? The fitting reply today, as it appears to me, is, that although this was undoubtedly true some thirty years ago, it is by no means necessarily true now, when the relative capabilities of the two operations of cutting and crushing have so greatly changed. The operation of lithotomy had arrived at its present perfection before lithotrity was invented. No results more perfect than had then been attained by its means have ever been accomplished by it since. On the other hand, the perfecting of lithotrity has been a progressive process from fifty years ago to this very day. The lithotrity of to-day is a better and safer proceeding than that of twenty or of ten years ago, and thus it is that the axiom about renal disease, right as it might have been then, has been growing less so year by year. *I believe it is reversed for stones which may be easily crushed.* In support of this conviction I have called before you six unimpeachable witnesses—I might easily have called more,—six patients who could not have been cut. To have placed those feeble and pallid frames on an operating table for lithotomy would have been to slaughter them outright. Of those six, five were saved. I believe, then, that for any stone of rather large size, *provided it is friable*—and calculi in these cases are mostly phosphatic, and therefore friable,—in a patient of broken health from advanced renal disease, if any chance exists from operation at all, it will be by lithotrity; and that in such a case lithotomy will be surely fatal. The choice in a bad case is lithotrity or palliative treatment; with a stone not easily crushed, it is lithotomy or palliative treatment, probably the latter.

But then it is impossible to overlook one condition, and it would be useless affectation to do so. I mean by lithotrity an operation carefully done by an experienced hand. Rather than have it done in any other fashion, let lithotomy be selected by all means. It is impossible to compare these two operations as we do some others—as we can, for example, any two modes for amputating a limb. Nor may we blink the fact that, while the lithotomy practice of one good surgeon may not differ greatly in the long run from that of another, it is impossible to deny that the lithotrity of the two may be wide as the poles asunder in its quality as an operation and as to the chances which it may offer to a patient. Thus it is that a bold, well performed lateral lithotomy is quite possible to the young surgeon at the outset of his career, while nothing but considerable experience can make him a good lithotritist. The two operations can never be compared, nor their capabilities estimated, without keeping in view this fact. You whom I address had better, when in practice in the country, decide in difficult or doubtful circumstances to cut rather than to crush, until you have acquired some facility in the practice of the latter art, unless, indeed, the stone be quite small. Do not touch with the lithotrite in any circumstances a stone which is rather large until you have had experience with a small one or two.

One great practical point remains, always recurs, and at last comes uppermost, on whatever side the great subject is considered. It is this: Detect the existence of a stone in the bladder early: it is always somebody's fault if not found early. The stone will then be small. It may be crushed at one or at most two sittings, with almost no risk. No question of cutting need ever arise; the presence of kidney disease need scarcely trouble you. I never in my life lost a patient, whatever his condition, whose stone was found and crushed when it was small; and I never expect to do so.—*Lancet, March* 8, 1878, *p.* 331.

53.—ON THE REMOVAL OF FOREIGN BODIES FROM THE MALE BLADDER.

By Dr. George H. Porter, Surgeon in Ordinary to H. M. in Ireland, and Senior-Surgeon to the Meath Hospital and County Dublin Infirmary.

[Few foreign bodies are met with in the male bladder, with the exception of portions of bougies or catheters.]

For the removal of foreign bodies which cannot be extracted along the urethra, lithotomy through the middle line of the perineum is, *par excellence*, the operation to be chosen. The highest authorities agree on this point. Mr. Erichsen says—"This is more safely done by the median than by the lateral operation of cystotomy." Ashurst states when treating of foreign bodies in the bladder—"In the male, however, it is usually necessary to resort to lithotrity (if the nature of the body admit of its being crushed), or to lithotomy, the *median* being in such a case the preferable operation." Again, Mr. Bryant writes —"In adults, possibly, the median operation may be chosen when the foreign body is not large."

There is a difference of opinion amongst surgeons as to the best way of reaching the staff, and by it the bladder, in central lithotomy. Allarton plunges his knife at once, with its back to the rectum, into the membranous portion of the urethra, placing the point of the bistoury half an inch in front of the anus. In the old "Marian" operation a cut was made on the right or left of the raphe upon the staff, beginning below the scrotum, and terminating an inch above the anus. Sir Henry Thompson says—"Respecting the modes of making the incisions, I prefer dissecting from the skin inwards to the staff, as in other operations, to the method by transfixion." He does not mention where he begins his incision through the skin.

Mr. Erichsen recommends a rectangular staff, resembling Buchanan's, to be used, and considers that "the surgeon can judge of the exact point where to enter the knife (directing it so as to open the groove just below the angle) which he cannot do with the curved staff."

I consider the recommendation of Sir H. Thompson, to cut from the skin inwards, most useful, particularly when the perineum is deep. In such a case the whole blade of the knife would be swallowed up if driven to the staff, according to Mr. Allarton's advice, and the heel of the blade would be brought to bear on the tough skin of the raphe; whereas the free division of the integument, in the first instance, facilitates the further separation of the structures to be cut through.

The operation I have four times successfully performed, and which I take the liberty of suggesting to others, is a combination of Allarton's and Thompson's; but differing slightly from both. It is briefly described as follows:—The staff, grooved on its convexity (and as large as possible), having been introduced, kneeling in front of the patient, I insert the forefinger of my left hand into the rectum with its palmar surface upwards, and fix it against the staff at the apex of the prostate gland. I then push Allarton's bistoury about a quarter of an inch in depth with its back to the bowel, half an inch anterior to the anus in the raphe, along which I then cut one inch and a half in length towards the root of the scrotum, freely dividing the skin and superficial fascia. This having been done, I return the point of the knife into its first starting place, and quickly plunge it to the staff at the apex of the prostate, making sure that I have freely opened the urethra, by moving the bistoury in the groove of the staff. I then cut forwards to the extent of the superficial incision. Still keeping the staff steadied with the point of the finger in the bowel, I introduce a long steel probe along the groove of the instrument into the bladder. Then having withdrawn the finger from the rectum, I introduce it on the probe, and dilate the prostate by insinuating the finger with rotary motion. This being accomplished, the forceps is passed in on the finger, the foreign body caught, and at once extracted. The following cases of foreign bodies in the bladder, and the surgical exertions for their removal, may be interesting to the profession:—

Case 1.—*Tight Organic Stricture of the Male Urethra; a large Portion of a Catheter lodged in the Bladder; the Stricture forcibly dilated; the Foreign Body extracted; Recovery.*—T. C., aged forty-three years, a married man, had suffered for three years from tight organic stricture of his urethra about four inches from its orifice. It was caused, apparently, by an injury received nine years before. He had it dilated on several occasions by different modes of treatment, but it always showed a great tendency to close again. He had been three times attacked with complete retention of urine, and was with great difficulty relieved. He was in the habit of introducing bougies himself, and allowing them to remain in the passage for some hours, and for the last two years felt satisfied with his own treatment without applying to a surgeon. He was never able to force a bougie larger than No. 4 through, or rather into the stricture.

On the 28th June, 1872, he came under my observation, and gave the following details:—He had cut off about five inches and a-half of a French bulbous catheter, which he forcibly pushed into the stricture, where he left it so tightly grasped, that he thought it impossible for the instrument to come out, or, on the other hand, to glide backwards into his bladder. He went out for a drive of two hours' duration, and on returning home discovered to his great alarm that, instead of remaining as he had placed it, the piece of catheter had worked its way through the stricture, and lay partially in his urethra and bladder. I thus found him in a state of great anxiety, complaining of acute pain in the region of the bladder, with a constant desire to pass water, which dribbled away on each exertion to avoid it. Pressure on his perineum gave intense agony. Having endeavoured to calm his mind, I had him placed immediately in a warm bath, and administered a draught containing tincture of hyoscyamus, liquor potassæ, laurel water, and camphor mixture. After remaining in the bath for twenty minutes I had him removed to bed, and told him I would endeavour to extract the piece of catheter early the following day. He was desired to repeat the warm bath in the meantime, as also the draught at ten o'clock p.m.

Here was obviously a most anxious case, and one that called for the best consideration prior to the adoption of operative measures. The stricture forbade the introduction of a forceps or lithotrite, to seize the foreign body, and the same difficulty was a bar to my passing a fair-sized staff, on which I might cut into the bladder. After having carefully weighed all the difficulties, I determined in the first instance to dilate the stricture, and then with a lithotrite catch and extract the piece of the catheter; but should I fail in this, at once to cut into his bladder and take it out. June 29th. Assisted by my friends Mr. Wharton and Dr. M'Cormick, I had the patient placed fully under the influence of chloroform; I then introduced "Holt's Dilator," and burst the stricture; on the withdrawal of the dilator only three or four drops of blood followed. I then passed a No. 9 silver catheter, to be certain that a way sufficiently large was made for a lithotrite, and also to push on the foreign body fairly into the bladder, should it be in any degree lodged in the prostatic portion of the canal. The stopper was allowed to remain in the catheter, to prevent the urine escaping, and as I passed the metallic instrument I distinctly felt the offending substance. I then rapidly withdrew the catheter, and replaced it by a small-sized lithotrite, which was with the greatest facility introduced. With this I felt the piece of the catheter lying to the left side of the patient's bladder, and having opened the blades of the lithotrite, I was fortunate enough to grasp it and extract it slowly, but without difficulty. I then drew off his urine, introduced a quarter grain morphia suppository into the rectum, and placed him comfortably in bed, with warmth to his feet. June 30th. He had a quiet night, and was free from vesical irritation. From this date he made a rapid recovery, and was about his business the sixth day after the operation. Probably no case could be presented more suitable to the "immediate plan" of treating stricture, and certainly the scientific course to adopt was the one which I pursued previous to resorting to the extraction of the foreign body by a cutting operation. The method I adopted was crowned with the most gratifying success.

Case 2.—A portion of a Gutta-Percha Bougie broken off in the Bladder; Calculous Formation around it; a Modification of "Allarton's Lithotomy;" Recovery.—J. M., aged twenty-five years, was admitted into the Meath Hospital under my care, May 8th, 1870. He had suffered from organic stricture for more than twelve months, and had been in the habit of treating himself by introducing bougies. About seven months previous to admission he had constructed a bougie from a piece of gutta percha, and on the first occasion that he passed it into his bladder a portion about three-quarters of an inch in length broke off when he was withdrawing the instrument, and this subsequently become the nucleus of a stone. When he came under my observation he was suffering from all the symptoms of a calculus in the bladder, and his health was greatly broken down. He got very little rest, his urine was loaded with pus, and contained blood. A No. 5 sound was the largest that the stricture would admit, and with this the foreign body was easily found. The contracted state of the urethra, and the highly inflamed condition of the bladder in a man so debilitated, prohibited the idea of removing the stone and foreign body with a lithotrite. I determined to cut it out.

Operation. May 13th. His rectum having been cleared out by a tepid water enema, at 10 o'clock a.m. he was brought into the operation theatre, and put fully under the influence of chloroform. He was quickly tied, and held in the usual position for lithotomy. A No. 5 staff grooved on its convexity was introduced, and firmly held by my colleague, Mr. Wharton. Then, kneeling, I inserted the forefinger of my left hand into his rectum with its palmar aspect upwards, and its point steadily pressing on the staff at the apex of the prostate gland. I then pushed Mr. Allarton's knife with its back towards the bowel a quarter of an inch deep, striking the perineum half an inch in front of the anus. I then cut forwards along the raphe to the extent of one inch and a half, dividing the skin and superficial fascia. I next fixed the point of the bistoury where I commenced my incision, and plunged it (with the cutting edge still away from the rectum) deeply until I lodged its point fairly in the groove of the staff at the membranous portion of the urethra. Having made certain that I had safely entered it, I cut forwards to the extent of the superficial incision. I then laid aside my knife, but still keeping my left forefinger in the bowel, I passed in through the wound a long steel probe, which I caused to glide along the groove of the staff into the bladder, proving that I was in the proper course by striking the end of the probe sharply against the stop at the extremity of the staff. And here let me recommend in the strongest manner the advantage of using a staff constructed with this abrupt resisting point in every mode of lithotomy, whether the surgeon hits it with the point of his knife in the lateral operation, or with the end of the probe as in the procedure under consideration; it proclaims that he has travelled the direct route, and is safely in the bladder. I then had the staff removed, and at the same time withdrew my finger from the rectum. Still firmly holding the probe with my right hand, I inserted my left forefinger (which had served whilst in the bowel to direct the knife in safety to the staff) along the probe into the bladder, and by rotating it two or three times I largely dilated the prostate. I felt the foreign body lying at the bottom of the viscus, below the level of my finger. I then took out the probe, and on my finger insinuated a small lithotomy forceps, with which I quickly seized the stone, and brought out a large portion; it broke, however, under the grasp of the forceps, so that I was obliged to remove the remainder of it by a second introduction of the instrument. I was aided by a careful washing out of the bladder by means of a strong syringe. The patient was now placed in a well-warmed bed, and had a morphine suppository passed into his rectum, and directions were given to keep him as dry as possible by placing folded sheets under his buttocks as often as required. The amount of bleeding was remarkably trifling, and the wound needed no dressing. May 14th. He had a most refreshing night, was free from the constant calls to micturate which disturbed him before the operation; his urine flowed freely through the wound, and his pulse counted only eighty; he did not suffer from any febrile symptom. May 16th. He expressed himself as greatly relieved, all feeling of bladder irritation had subsided, and the urine passed constantly through the wound. It would be tedious to relate the daily condition of the patient; he improved in health rapidly, the urine began to flow through the urethra on the sixth day after the operation, the wound closed in the most healthy and satisfactory manner, and he left the hospital cured four weeks after the removal of the foreign body.

Case 8.—Nine inches and a half in length, of a Gum Elastic Catheter lodged in the Male Bladder and surrounded by Phosphatic Deposit; a Modification of Allarton's Lithotomy; Recovery.—J. T., aged thirty-eight years, by trade a plumber, was admitted into the Meath Hospital, under my care, November 28th, 1872. He had suffered from stricture of the urethra for two years previous to his admission into hospital, and had himself been in the habit of passing bougies and catheters occasionally during the last eighteen months of that period. Nine weeks prior to coming under my notice, in withdrawing a gun elastic catheter (No. 6), which he had introduced, it broke across, leaving one inch and a half of the instrument between his fingers and thumb. The larger portion he immediately tried to take out his urethra, but failed in the attempt, and, in about an hour afterwards, it slipped into his bladder. For two days subsequently he felt no annoyance, and was able to follow his usual occupation. On the third day, however, after the accident, he felt great pain during, and at the termination of, micturition in his glans penis; his urine was bloody, and any sudden motion increased his suffering. He placed himself under the care of a surgeon, who commenced to dilate the stricture before attempting the removal of the foreign body; but the patient became anxious for speedy relief, and left the hospital while he was undergoing treatment. He then applied to my friend Dr. Trimble, of Castlebellingham, who detected the foreign substance in his bladder, and recommended him to come to me.

On admission to the hospital, I found him suffering from frequent calls to make water, so often as ten times during the night. His urine was bloody, and contained pus and ropy mucus. One small piece of the exterior of the catheter had been expelled, and numerous fine fragments of phosphatic deposit also came away. Nov. 29th. I sounded him with Sir Henry Thompson's sound, and soon felt the catheter which, on being struck, gave the sensation as if it were more or less encrusted with calculous matter. I ordered him to remain in bed, and prescribed sedative medicine, with diluent drinks. In consultation with my colleagues, it was considered a case not suitable for an attempt to extract the foreign body by the urethra. The catheter, it was considered, might break (if caught in a lithotrite) into pieces, which could not be washed away with the flow of urine, but remain to form the foundation of other deposits. And even if it did not thus become disintegrated, it could not be drawn through the urethra in its coated condition without lacerating the canal to a dangerous extent. The highly inflamed state of his bladder also prohibited such instrumental interference. I therefore decided upon performing the operation which I have above described, and which I strongly recommend. I operated on the morning of December 4th, and removed the portion of the catheter. The operation was done under the influence of ether, which was kindly administered by my colleague Mr. Smyly in a very efficient manner. The patient made a very satisfactory recovery. The urine passed through the penis on the fifth day, and he left the hospital, with the wound healed and in fine health, on the 7th January, 1873.

Remarks.—The accident of a catheter or bougie slipping backward into the bladder is by no means so uncommon as is generally supposed; and every surgeon should carefully examine instruments prior to using them. Age reners them brittle and unfit; and, even when their condition is sound, the utmost precaution should be adopted (when allowing them to remain in the urethra) to secure them in such a manner that they cannot recede, or glide forwards from the canal. When a portion of a soft bougie or catheter is for a short period lodged in the bladder, it is not an easy procedure to feel it with a sound; and this fact is alluded to by Mr. Fleming, a gentleman who has devoted much attention to injuries and diseases of the urinary organs, in his description of a case in which a bougie—which had been introduced and left in the urethra—escaped into the bladder.—Dub. Hosp. Gazette, Sept. 1, 1858. A very interesting case is reported by my friend, Mr. William Stokes, Professor of Surgery in the Royal College of Surgeons, in the first number of the Irish Hospital Gazette. This was a case of the removal of an *entire* gum elastic catheter from the bladder by Allarton's operation.—*Dublin Journal of Med. Science, Feb.* 7, 1873, *p.* 106.

54.—ON THE TREATMENT OF STRICTURE OF THE URETHRA.

By Sir HENRY THOMPSON, Surgeon-Extraordinary to H. M. the King of the Belgians, Surgeon and Professor of Clinical Surgery to the University College Hospital.

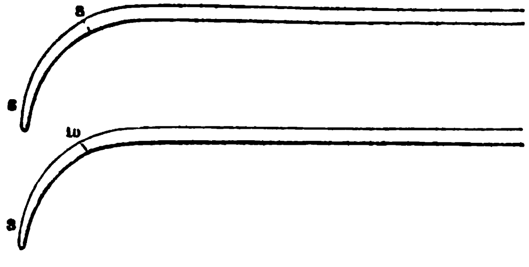
I propose to examine the question of treatment only—the treatment of that organic change in the walls of the urethral canal which constitutes stricture, and especially when it occurs, as it most commonly does, at or near the bulbous part, a region which may certainly be comprised within two inches of the canal, and which may be said to commence at about four inches from the external orifice. When stricture occurs at the orifice, or within the anterior two or three inches of the urethra, it differs somewhat in regard to the treatment necessary for the common or typical stricture seated further down, but this will be referred to hereafter. Unless specified to the contrary, then, I speak here of the common form thus indicated.

A patient who has not long been the subject of stricture may, as a rule, be successfully treated by simply passing soft instruments, gradually increasing their calibre until nearly that of the healthy urethra is attained. This is called simple dilatation. The choice of instrument is important. A soft, flexible, conical bougie, with a small bulbous extremity to prevent what would otherwise be the point or apex of the cone getting entangled in one of the many small cavities in the walls of the passage, is on the whole, the best, at all events up to a certain stage. But these very qualities of softness and flexibility, which diminish so greatly the disagreeable sensation when passing and the chance of injury to the patient, and which render these instruments so valuable, constitute them inefficient when you arrive at a point at which the hardness or resistance of the stricture is too great for their power of penetration. What is the next step? What substitute do you employ? Are you to relinquish the process of dilatation, and think of performing any operation? By no means. You will now resort to the firmer and less flexible instruments; and there are few which are more efficient or easy to pass, at this stage, than the conical steel instruments, which are all the better when silver plated. The sizes which I should recommend you are not to be small—indeed, none smaller than the following, of which I don't know that the first is not too small for any but very careful hands.

The first, say No. 6 (English scale) at the point, gradually increasing to No. 8 at about two inches and a half from it, as represented in Fig. 1.

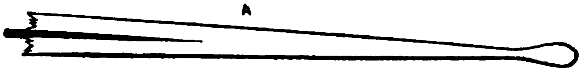
The next, No. 7 at the point, and No. 9 at the largest part.
The next, No. 8 " " No. 10 " "
The next, No. 9 " " No. 11 " "
The next, No. 10 " " No. 12 " "
The next, No. 11 " " No. 13 " "

Fig. 1.



These conical dilators—I scarcely like to call them "bougies," a term so inappropriate for metal instruments, and which certainly, if retained at all now that the thing itself, the wax candle of our forefathers, is obsolete, should denote only flexible instruments—may be passed with great ease owing to their polish and weight; while they can scarcely be surpassed for efficiency in the later stages of dilatation. I recommended them equally twenty years ago, and have in no way changed my mind about them. You may, however, like something intermediate between the very flexible bougie and these metallic dilators; and many means for combining the flexibility of the former as to the point, and the stiffness of the latter as to the stem, have been contrived—such as gum elastic, flexible metal, &c. Of late I have adopted a plan which I prefer to those, and for all sizes from No. 4 to No. 8 or 9 (English) it is perhaps better than any. I have had a short and very soft lead stylet, made to be introduced at pleasure into the interior of the French conical bougie, and terminating in a fine point, which stops short about four inches and a half from the end of the bougie. Here is a set of them: six in all. The following diagram will explain what I mean. A section shows the moveable lead stylet in the interior, but is represented as extending much too close to the end, which should be long and flexible. (Fig. 2.) Their maximum diameters are about 5½, 6¼, 7, 7¾, 8½, and 9½ inches—a series which may well intervene between the soft bougies and the metallic dilators. Capability to penetrate easily is ensured by the complete flexibility of the point, and the increased firmness of all the rest of the instrument.

Fig. 2.



It may be as well perhaps just to advert to the fact that we require also a delicate metallic instrument to penetrate where a stricture is very small and tight. When I find that no stream exists, that a mere succession of drops is the only method by which relief is attained, I try at first a very small gum catheter, the smallest that handicraft can produce, a No. ½ of our scale; and if with a little coaxing this cannot be passed—and it very often can, to the great advantage of the patient, since it can be tied in and retained without risk or pain,—I resort at once to a very small silver catheter, the point of which can be guided with great care through the narrow orifice, on the system I have in another lecture described to you, and will not repeat here. If this be safely accomplished, you will do well to tie it in for forty-eight hours or so, keeping the patient quite quiet in bed, and replacing it then, if it is loose, by a gum instrument. You may continue the process of "continuous dilatation" by tying in one after another until you have reached No. 8 or 9, as you will do in a few days, if the patient desires to be dilated rapidly and can give complete leisure to the treatment. If, however, he desires not to be a prisoner, or to continue his avocations, you substitute the ordinary dilatation—that is, the passing an instrument every two or three days, removing it immediately after it has been passed, and letting him go about his business as usual. The early stage of dilatation passed, you will go next to the French flexible instruments, and then onwards as already described.

So much for dilatation. As to the occasional occurrence of rigors and other troubles, I have discussed them fully with you already. The mechanical question is our only subject to-day. But supposing that, although you have succeeded in dilating the urethra up to a fair size, the narrowing rapidly returns in spite of periodically passed instruments; or that difficult micturition still exists; or that retention of urine often occurs: is it not clear that something further is necessary? In other words, if dilatation proves insufficient, what then? This question I propose for the next part of my subject.

The mechanical modes of overcoming a narrow and contractile stricture when dilatation has proved insufficient may be for the most part regarded as of two kinds—rupture or forcible distension of the opposing tissues by power exerted from within outwards; or division by a knife in some form, and applied generally within the urethra, occasionally from the external surface.

The method by rupture introduced by Mr. Holt has been largely employed for the treatment of strictures of various degrees of severity. It is an operation generally involving but little risk, although it has been sometimes followed by fatal consequences. My principal objection to it is, that the benefit obtained is certainly not very enduring in severe cases of stricture, and it is for such only that operative measures are necessary.

I cannot say much more for the forcible "over-distension" proposed by myself, and now practised much and, as would appear, successfully in America. By both these methods an admirable result is achieved at once, and the former method especially is so simple in execution that it can be applied by an almost unpractised hand. I am not at all certain, however, that it is an advantage to the patient that an operation should be so easily applicable by an inexperienced practitioner. The consequence has been, and not so very seldom, that the operation has been performed, owing to such inexperience, on patients for whom no operation of any kind was ever necessary.

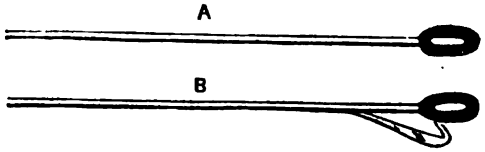
[A most ingenious instrument for division of stricture is that of Dr. Corradi, of Rome. It consists of what appears to be a small silver catheter. After introduction a screw in the handle is turned and a strong wire issues laterally from the lower third of the instrument forming the chord of an arc with the curved portion. The wire, however, does not divide a hard stricture and only teazes and inflames it.]

Now for the most severe forms of stricture — those in which, after a duration of many years, the constituent tissues are so tough and so resilient that the mere introduction of a bougie only augments the patient's symptoms—I have found nothing so efficient, so safe, and so certain as internal urethrotomy. I by no means say any kind of urethrotomy. Anything short of complete division of the hardened tissue is not efficient. Overdistend these strictures, or tease them with dilatation in any fashion, and they are rendered more than ever unmanageable, and you only provoke an attack of rigors, and sometimes prolonged constitutional disturbance of a severe kind. For this operation we have numerous instruments and systems to choose from; their name is legion. Modification after modification has been made of the earlier forms of urethrotomes, both by instrument makers and by surgeons, with the view of accomplishing more perfectly the original design, which is that of ability to divide easily, and more or less freely, the hardened tissue.

One of those early forms I still prefer, that of Civiale. I do so on account of its extreme simplicity. With but little of mechanism, it responds like a scalpel to the hand. In fact it is merely a long-handled knife, with a delicate little blade, which being passed, sheathed, to the other side of the stricture, is then unsheathed and drawn through it; and the extent, whether of depth or length, of the incision is regulated with ease and accuracy according to the will of the operator. This, in my opinion, is far better than a machine which makes a certain incision mechanically, and is not controlled and guided by the intelligence of the surgeon.

The method of performing it is as follows:—First, you will ascertain by measurement precisely where the stricture is; its distance from the external meatus. Secondly, you must ensure that the stricture is, at the time of the operation, sufficiently patent to admit the bulb of the urethrotome to be passed through it. This is an important point, and I must dwell on it for a few moments. Let me remark that the bulb of this urethrotome, as made in Paris, is much larger than it ought to be. The instrument I employ is modified thus:—The bulb is only the size of No. 5 or 4½ (English scale), instead of No. 7, the usual French size. The stem of mine equals in size only No. 3, and the instrument is at least one inch and a half shorter (see Fig. 3). Now as the stricture which you have to treat probably admits only No. 1 or 2 at the most, it is necessary to tie in a small gum catheter for two or three days or more previ-

Fig. 3.



Urethrotome described in the text. The upper figure shows it closed, the lower open.

ously, so as to dilate it temporarily, which is always practicable, and bring the stricture to the requisite size for admitting the bulbous end of the urethrotome to pass through it. However contractile the stricture may be—that is, liable to narrow speedily after dilatation, you can always thus temporarily dilate it for our purpose. Of course, if the stricture in question were susceptible of *durable* relief by dilatation, it would be unnecessary to do more, and you would not think of dividing it. Having then arrived at a calibre of No. 4 or 5, by tying in, I prefer to give the patient chloroform. I then withdraw the inlying catheter, and at once pass carefully the bulb of the urethrotome through the stricture, which usually requires a little gentle pressure and management, when the little bulb is felt free and moveable in the urethra on the further side. In this situation I make the blade project to the requisite extent by means of the simple mechanism in the handle which I show you, and, directing the edge to the floor of the urethra, press it firmly there and draw it boldly outwards, so as to make an incision, say, an inch and a half or two inches in length, and by this means divide all the thickened tissues which constitute the stricture. You feel them sometimes offering much resistance. Take my word for it, you need not fear freedom of incision. I never saw any serious harm of any kind produced, although I have seen less success resulting than I desired, when I have not sufficiently divided the stricture, as may have been the case in some of my earlier experiences, and have so left a fibre or two uncut. But I have never had occasion to regret a free and complete division. Next you introduce a No. 13 plated sound, not conical, which should go quite easily into the bladder, and not be in the least "held" on withdrawing it. Keep along the upper portion of the canal, and the point of the instrument will not get into the incision. Then take a No. 11 or 12 well-curved gum catheter and pass it into the bladder, tying it there in order to retain it forty-eight hours. It is best to introduce it on a well-curved stylet to avoid the wound, which otherwise the point of the instrument might get into. Of course the stylet is withdrawn immediately afterwards.

Now in all the operations I have done—nearly two hundred in number—I have never seen any bleeding to signify. Sometimes only a few drops appear. On two occasions I have had some extravasation of urine when the catheter became displaced, but not nearly so bad as I have seen following "rupture"; and once only an abscess has followed. And you yourselves can also form a judgment to some extent of these questions, since you must have seen at least twenty cases of this operation in the wards during the last twelve months. Once only have I seen a death after it, and that was in one of the worst cases of old and unrelieved disease which we have ever seen, in one of my wards, about a year and a half ago, in which I used it as a forlorn hope.

It is not uncommon to have an attack of fever, which also happens not unfrequently after the use of the lithotrite, but it is by no means the rule. It appears, if at all, after the withdrawal of the inlying catheter; the first time the patient passes his urine a drop perhaps enters what remains of the incision, and he has a rigor in an hour or two's time, and that is all. To avoid this as much as possible I always adopt the following plan: I withdraw all the urine, of course, when removing the catheter, forty-eight hours after the operation; order the patient a hot hip bath for fifteen minutes, and send him back to bed to be well covered up, with instructions not to pass water until he feels a manifest desire. This will probably not occur until six hours after the instrument has been withdrawn. He then stands up, makes a full stream, is generally very much astonished at its volume and the ease with which it flows, and goes back to bed as before for the day. Following these precautions, you may hope he will escape the rigor; but if not, you know, at all events, that there is no risk and no ground for anxiety. Sometimes—but this is quite exceptional—the fever is somewhat more severe and prolonged. The subsequent treatment may be briefly sketched: On the fourth day after the operation pass a conical French bougie with a large bulb, so as not by any means to open the little wound. If the point is felt in the slightest degree to encounter an obstruction, withdraw it and pass a well-curved gum-elastic instrument, which is not conical; the former, however, usually suffices. Again in three or four days, Nos. 11 and 12 mostly pass with considerable ease. After this once a week, and the patient will pass the instrument himself at increasing intervals, ultimately arriving at, say, once a month.

This operation gives, I believe, more lasting results than any other. You have seen me perform it for cases which have experienced every known treatment, and have become as bad as ever. I do not claim for it the removal of organic contraction—that is impossible. The treatment has yet to be devised which will remove absolutely and for ever the occurrence of recontraction in a patient once the victim of an organic stricture.

A few words relative to strictures within two or three inches of the external meatus. As a rule they are very non-dilatable, and the best treatment is incision. They are close to the hand, and nothing is easier than to divide the obstruction by means of a small bistourie cachée. No doubt one reason why they are so little acted upon by the simple bougie is that the urethra here is so little surrounded by spongy tissue, and so much by firm fibrous tissue, that there is really less room for dilating, and less of that soft tissue which exists so abundantly around the bulbous portion. The operation in question is so simple as not to require further illustration here, and the rules I have laid down for the performance of internal urethrotomy may be held as applying in these cases also.—*Lancet, Nov.* 30, *and Dec.* 7, 1872, *pp.* 669, 805.

55.—ON A NEW METHOD OF TREATING RETENTION OF URINE AND IMPASSABLE STRICTURE.

By Furneaux Jordan, Esq., Surgeon to the Queen's Hospital, and Professor of Surgery at the Queen's College, Birmingham.

[With care, skill, perseverance, and time, the cases of stricture in which an instrument cannot be passed are very few. Now and then operative interference is needed, and usually either vesical puncture or perineal section is resorted to. The operation to be described is intended as a substitute for either of these. The following case is an illustrative one:]

A man past middle age came into the Queen's Hospital with a distended bladder and some dribbling. Careful and repeated efforts to pass instruments failed. I then carried the left forefinger and a curved sharp-pointed bistoury into the rectum. I thrust the point of the bistoury forwards through the anterior median line of the rectum, an inch and a quarter from the anus, into the membranous part of the urethra, and drew it forwards for a short distance through the incision. I readily introduced my finger into the urethra, and could bring it to the stricture in front or carry it backwards into the bladder. Directing the tip of the finger to the stricture, I conducted a probe-pointed French bougie (six, English scale) along its concavity. It passed forwards through the stricture with unexpected ease and emerged from the end of the penis. One end of the instrument was now at the urinary meatus, the other at the anus. The ivory open end was cut off smoothly, drawn into the urethra, and carried by the finger backwards into the bladder. The urine flowed freely, at first through the incision and then through the catheter. The catheter was retained twenty-four hours. A few feet of small India-rubber tubing conducted the urine to a convenient vessel. At the expiration of twenty-four hours the catheter was withdrawn, and a No. 8 was passed with difficulty through the meatus. In a day or two a No. 12 bougie could be passed with ease. He was now allowed, for a few days, to pass urine by natural efforts. With each act of micturition, a little urine entered the rectum. The next step was to close the rectal fistula. The urine was drawn several times during the twenty-four hours, especially before each act of defæcation. The wound, thus kept from contact with the urine, closed completely in eight days. The man himself discovered his good fortune by passing urine, against orders, on the eighth day. He entered the hospital haggard, wasted, feeble and at death's door. He is now in good health.

When I first entertained the idea of treating stricture from its bladder side, the question arose whether I should pass an instrument from the bladder, incising it close to the prostate for the purpose, or from some part of the urethra behind the stricture. My first impression was, that it would be practicable to make a limited incision into the bladder through the rectum at the spot usually selected for puncture with the trocar. In the dead body, without stricture, everything occurred as I expected it would. It was quite easy to make a limited vertical incision close to the base of the prostate; the tip of the finger, introduced through the incision, immediately came into contact with the vesical orifice of the urethra. Along the concavity of the finger, a French bougie passed readily forwards through the urethra, and made its escape at the external meatus. But on the living man, with an old stricture and a largely dilated membranous urethra, everything was different. I found in the case above cited, that the prostate gland was carried a considerable distance backwards and upwards into the pelvis. I did not remember to have seen any reference to such a condition in surgical writings; but a moment's consideration told me that such an altered position of the prostate must necessarily be present not only in the case under treatment, but in every case of dilated membranous urethra. The explanation is close at hand. In front of the membranous urethra is the triangular ligament. It is clear that this, with its strength, tension, and attachment to the pubic arch, and the penis in front of it, cannot be driven forwards to any appreciable degree. The dilatation of the urethra occurs in all directions—longitudinally as well as laterally, longitudinally possibly even more than laterally. It follows that the older and more neglected the stricture, and the more dilated the membranous urethra, the further backwards must the prostate be thrust.

The bearing of this altered position of the prostate gland on the ordinary operation of puncturing the bladder by a rectal trocar is very important. The prostate is driven nearer, perhaps close, to the peritoneal cul-de-sac. Puncture of the bladder under such circumstances is likely to endanger the peritoneum with a too certainly fatal result. It once happened to me to be made acquainted with three cases of puncture of the bladder by the rectum which were successively fatal; this, too, in competent hands.

Bearing in mind, then, the dilated membranous urethra, the deeper and more dangerous position of the prostate gland, and repeated experiments on the subject, I am led to prefer, as a rule, opening the urethra in front of the apex of the prostate gland. The ordinary puncture by the rectum merely relieves the retention. It is near, sometimes unavoidably through, the peritoneum. It is not unfrequently fatal. Perineal section of any kind is mostly, in the opinion of all experienced surgeons, a difficult, deep, and often unsuccessful dissection. The operation I have just performed is a simple incision through only a thin wall of tissue, free from important vessels or erectile tissue.

It is beyond all doubt that an instrument must pass more easily the way the urine flows, as it is beyond doubt which way water can be most readily passed through a funnel. Every fold, ridge, ruga, orifice, or lacuna inclines towards the meatus. A hundred thousand acts of micturition have driven these all one way. The stricture itself is a funnel, the smaller end of which is directed outwards. False passages are often present in old and difficult cases; they lie anteriorly to the stricture. Should the surgeon prefer to pass an instrument from the meatus, the finger placed on the bladder side of the stricture, enables him to guide it with an accuracy otherwise unattainable.

As regards the ease and certainty with which the membranous urethra can be opened from the rectum, let me observe that I have never failed to open even the flaccid and collapsed tube in the subject; in old and impassable stricture, the membranous part of the urethra is, as a rule, dilated. In the cited case, I passed the bistoury on the finger. The rectal speculum may be used instead of the finger.

After opening the urethra, the treatment which I adopted was "continuous dilatation;" this will probably prove the most generally useful. The same incision may, however, prelude the treatment of the stricture by rupture, excessive dilatation, internal incision, or escharotics by instruments carried through either the rectum or the urinary meatus.

A word on the "continuous dilatation" treatment. With the French flexible instruments, this treatment is admirably efficient and quick. It has this great advantage—in old stricture with probable renal disease, it gives rise to less shock than any other kinds of rapid treatment, valuable as many of them are. The illustrious Liston had a contempt for flexible instruments. I hope you will agree with me in the opinion that the Flood, as I have said elsewhere, did not come after him, and that Providence has been kind enough to permit surgery to make advances since his death.

It may happen that instruments will be purposely devised to act on stricture through the rectum. It is certainly desirable, if it be practicable, to have at hand French catheters and bougies made alike—that is, probe-pointed at both ends, so that the end which is drawn into the membranous urethra may be readily pushed backwards into the bladder.

I do not think there is any danger of a rectal fistula. A clean incision without loss of substance would probably heal in time, even if left alone, if the stricture be well dilated, as the lithotomy wound heals. It would not be difficult to close the wound with sutures at the time of the incision, or by a later operation. Perhaps the simplest and best method of closing the fistula is the frequent use of the catheter—a method which is very certain to succeed. If an exceptional difficulty in closing the opening occurred to me, I would draw off every drop of urine, divide the anal sphincter on one side, and keep the bowels quiet.

Another advantage in the operation which I have brought before you is worth alluding to. The curve-pointed bistoury in your pocket-case, or even a common penknife, might enable you to save a man from extravasation of urine, or even death, if you had no other instrument at hand.

But suppose, when you have carried your finger into the membranous urethra, you are unable to pass an instrument forwards through the stricture. Should this occur, which is unlikely, I should introduce a catheter through the rectum, the wound, and the prostatic urethra, into the bladder, and retain it there for a time. If it slip out, you can easily introduce it again. Puncture of the rectum sometimes requires to be repeated frequently. After a little rest, the instrument would probably pass forwards through the stricture. With a funnel-orifice and probably false passages in front, an instrument will always pass more readily forwards than backwards.

When I say that a finger can readily be introduced into the urethra, I am not speaking of very large fat fingers; but probably even with these there would be no great difficulty. Bear in mind, the living urethra is much more dilatable than the dead.

Bear in mind, too, as we are again speaking of anatomy, of the diversity presented by the shapes, sizes, relations, and curves of all our internal organs. In the pelvis, as elsewhere, every anatomical peculiarity is as individual and varied as are our noses or chins. Do not, therefore, underrate the value of anatomical knowledge. Anatomy itself—not ignorance of anatomy—teaches anatomical diversity.

The operation which I have just described I believe to be simpler, safer, and more efficient than the alternative operations commonly adopted for the treatment of stricture of the urethra. We must not forget, however, that old and neglected stricture is usually accompanied by disease of the kidneys. If this disease be advanced, the performance of any operation whatever on the urinary organs is attended with risk to the patient.—*British Medical Journal*, *Nov.* 9, 1872, p. 517.

56.—THE TREATMENT OF STRICTURE.

By Dr. P. J. Molony, B.A., Waterbeach, Cambridge.

The difficulty in passing a catheter from before backwards, through a stricture, arises from the certainty of the end of the instrument catching in the pouch which surrounds the stricture; or, to use Mr. Jordon's apt simile, its getting under, over, or at the sides of—in fact, outside—the narrow end of the funnel. Now the prevention of this is easily effected by what is generally known as "Hutton's railway catheter," or, rather, by a slight modification thereof. That commonly used consists of a No. 2 flexible catheter, cut off at the eye, and a piece of catgut instead of stylet, which, on the end of the catheter reaching the stricture, is pushed on into the bladder, and then serves as a railway for the catheter to run on. If, instead of a No. 2, we take a No. 10, cut smoothly across at the eye, and pass it down to the stricture, it is evident that its end will go into and fill up the circular pouch, and the centre of the stricture will project into the catheter somewhat like the os uteri into a vagina speculum. The next thing to be done is to inject a small quantity of oil into this tunnel, and then proceed to use the smaller instrument determined on, which may be a piece of catgut, a filiform bougie, or a No. 1 catheter. By the above method I lately succeeded in a case when I had almost given up hope; and I believe it may be of use in some other difficult cases, so I think it right to ask for it a trial.—*British Medical Journal, Nov.* 30, 1872, *p.* 605.

57.—ON RETENTION OF URINE.

By Dr. George H. B. Macleod, F.R.S.E., Professor of Surgery, University of Glasgow; Surgeon and Lecturer on Clinical Surgery, Royal Infirmary.

We receive a large number of these very troublesome cases. As a rule, the retention is due to organic stricture, but not a few patients present themselves in whom the retention arises from the congestion which so often follows a fit of intemperance. There are few affections in which one has more frequently to deplore incautious and rash interference, than those of retention, from whatever cause arising. Very few cases come into the hospital that have not been seriously injured by the careless or ignorant employment of instruments; and, in the great majority of these cases—those of organic stricture and enlarged prostate—relief is obtained, after admission, without having recourse to instruments at all. The rule in my wards is to give these patients a warm bath, and to inject subcutaneously $\frac{1}{8}$th gr. of acetate of morphia when they are in the bath. If this fail, they get a full dose of castor oil and tincture of opium, followed by another hot bath, and if that fails I am sent for. I can easily recall the few cases, out of the large number admitted in which I have been forced to employ the catheter to relieve pressing symptoms, and in no case since I entered the hospital, has it been necessary for me to puncture the bladder. Chloroform is of inestimable service in the management of such cases. Twice within six months I have been able to fulfil two objects—to relieve the bladder and cure the stricture—when compelled to use instruments in retention, and it was as bearing on that circumstance, that the foregoing remarks were made. Having failed in one case of very close organic stricture, with much laceration of the canal, to introduce a catheter, I passed, with little difficulty, Holt's dilator, which, from its shape and construction, is very well fitted to pass a tight contraction, and thus I was able to split up the stricture at the same time that I relieved the bladder. This I have subsequently repeated in a similar case, with equally good effects; and, as such a use of Holt highly commended itself to me as a ready and effectual way of "killing two birds with one stone," I thought it worth while to relate it. I may add that it were well if the profession without the walls of the hospital would exercise more caution, and use less force in dealing with cases of retention.—*Glasgow Medical Journal, May,* 1872, *p.* 329.

58.—A CASE OF IMPASSABLE STRICTURE OF THE URETHRA SUCCESSFULLY TREATED BY LEECHING AND GRADUAL DILATATION.

By W. F. Teevan, Esq., Surgeon to the West London and St. Peter's Hospitals.

W. C., labourer, aged 45, was admitted into the West London Hospital on November 10, 1871, for retention of urine. The house-surgeon, Mr. Hill, was unable to pass any instrument, but relieved the patient with a hot bath and an injection of laudanum into the rectum.

Past History. Twenty-five years ago he caught a gonorrhœa, which degenerated into a gleet, lasting for one year. The complaint was treated with medicines only. Twenty years ago he began to suffer from an increased frequency of micturition, and the size of the stream gradually got smaller; eight years ago he got his first attack of retention, for which he called in a surgeon, who could not, however, pass any instrument, but relieved him with a hot bath and some physic. A few years ago the patient paid three visits to a hospital, but no instrument could be passed through the stricture.

Present Condition. The patient is an active man, of thin wiry frame, and does not look much amiss. States that he is incapacitated from following his work, as he wants to urinate every ten minutes during the day and every hour in the night.

November 11. To-day Mr. Teevan tried, without success, for half an hour to pass various instruments. On the 15th, 18th, and 22nd he repeated his efforts, but with no result. The stricture was ascertained to be a long tunnel one in the subpubic region.

25th. To-day six leeches were applied to the perineum, which bled freely for some time.

29th. Mr. Teevan succeeded in passing the smallest silver catheter into the bladder, and drew off some urine. The instrument was withdrawn in a quarter of an hour, as it caused considerable irritation.

December 2. No catheter could be got into the bladder to-day.

6th. 2 p.m. : Six leeches were put on the perineum, and at 4 p.m. the catheter was successfully passed into the bladder and allowed to remain for half an hour. The patient was unable to bear it in for a longer period.

On December 9, No. ½ silver catheter passed; December 13, Nos. 6 and 7 (French gauge) elastic olivary bougies were successively passed and left in for a few minutes; on December 16, No. 8; and on Decemder 21, Nos. 9 and 10 olivary bougies were introduced.

The patient left the hospital on December 23, but came again on December 30, when only No. 9 could be introduced. He states, however, that he can pass a fair stream, and holds his water for several hours.

On January 3, 1872, Nos. 9 and 10 passed, and on January 6 Nos. 11, 12, and 13. Patient has resumed work. Can hold his water for five hours with perfect comfort. Is only twice troubled at night.

On January 10, No. 14; January 13, No. 15; January 17, No. 16; January 20, No. 17; January 24, No. 18; January 27, No. 19; February 3, No. 20; February 20, No. 21.

Mr. Teevan remarked that there were several points of interest in this case. The first thing to be noticed was that the patient had never used an injection for his gonorrhœa. There was still a lingering belief amongst some surgeons, and particularly the public, that injections might cause a stricture; but his experience told him that injections never caused stricture, unless, indeed, they were of great strength. If 100 patients be examined regarding the way their gonorrhœas had been treated, it would be found that only about half had ever used injections, thus clearly proving that the objection to their use was not founded on any facts. A strong injection, however, might cause stricture, as he recently had had two gentlemen under his care for stricture of the urethra in whom the complaint had apparently been caused by the application of a strong solution of caustic for spermatorrhœa. Mr. Teevan observed that four surgeons, including himself, had utterly failed, after long and renewed efforts, to pass any instrument, and it was not until he freely leeched the perineum that he was able to introduce a catheter, although the patient had been placed in the most favourable circumstances for catheterism, as he had been kept quiet in bed for a fortnight, and freely purged. It was therefore perfectly clear that all the good in this case had been achieved by the leeching. Now, this useful auxiliary was but little employed in England, on account of the public prejudice against the abstraction of blood; but it was capable of affording great relief in the treatment of retention and impassable strictures; and he would wish to confirm the remark of M. Boret, of Tamboff, to the effect that the administration of chloroform was useless in the treatment of retention or stricture, for if an experienced hand could not introduce an instrument, the administration of chloroform would not enable him, as it does not reduce bulk; whereas leeching and bleeding are most useful, as they lessen quantity and increase the capacity of the constricted urethra by withdrawing blood from the vessels in and around the tube. Mr. Teevan, in conclusion, stated that this was the only case in which he had ever succeeded in passing a silver catheter after failing to effect the desired object with filiform or whalebone bougies.—*Med. Times and Gazette, Feb.* 8, 1873, *p.* 141.

59.—ON THE SELECTION OF POSITIONS FOR CATHETERISM.

By W. F. Teevan, Esq., B.A., Surgeon to the West London and St. Peter's Hospitals.

The position to be adopted when an instrument is required to be passed must be considered in its twofold aspect, as affecting patient and surgeon.

I think it may be said that in this country it is usual for the manipulator to stand by the side of the patient, whom he has placed in the recumbent posture; and it is not difficult to discover the reason of the custom, for, as metal instruments have usually been employed, it followed as a matter of course that the patient was forced into the recumbent position, as the only one in which he could have endured the pain and annoyance resulting from prolonged catheterism. The surgeon who is about to pass an instrument is similarly situated to a captain steering his vessel into harbour through a tortuous channel, and a very cursory view of the course pursued by the latter will show that there is much to be gained from noticing the position adopted by the captain. The first thing that strikes us is that the captain so places himself that his body, axis of vision, vessel, and the point to which he is steering, are all in the same median plane. Now he derives the greatest possible advantage from this method, and in fact places himself in the most favourable position for accuracy. The late Professor De Morgan stated in one of his lectures that there were but few men who could shut their eyes and then picture to themselves three separate and distinct lights, and that, as a rule, the majority of men could only imagine two points clearly apart; for if they tried to picture more the images became indistinct, confused, and quickly merged into one or two. Therefore the fewer the points we have to carry in our mind's eye, the easier will it be. In everyday life we see men instinctively carrying this out, and whether we observe the captain, engine-driver, or rider or driver, we see them one and all reducing the points to the fewest possible, and putting them all in the same median plane. The surgeon, however, who stands by his patient to guide a catheter into the bladder dislocates his points, if I may use the expression, and places himself in the most unfavourable position for success. I would, therefore, premise my observations by saying that whatever positions be selected they ought all to lie in the same median plane, and I feel sure that a very short trial of the comparative merits of both methods will convince the operator that it is much easier to steer a catheter into the bladder when all the points are in the same median plane, than when he has dislocated one or more of them, by placing himself at an angle to the path along which he has to guide his instrument. The position for the surgeon ought to be selected before that for the patient, inasmuch as the first is the active agent in the operation—he has to do something, often very difficult, and he ought to be permitted to choose that position in which he will be most likely to attain success. The surgeon is the active agent, the patient the passive; the former ought to have the greatest freedom of motion, the latter had better have none at all, the more fixed he becomes the better. Let there be the greatest amount of mobility in the instrument, but none at all at the gateway. Now, there are three positions open to the surgeon: he can stand, or sit, or kneel down. We may dismiss the last from discussion, as it can only be required in some very exceptional cases. The standing position, which is the one usually followed in this country, has four great disadvantages attached to it: it is the most fatiguing; it is the one in which the operator will find his delicacy of touch impaired if the manipulations be prolonged; it is the one in which the surgeon is most likely to lose his temper or become impatient; and, lastly, it is the most favourable position for making a false passage. I consider the last objection to be the most serious, for false passages, when met with, are nearly always to be found in the lower wall of the urethra, and they occur there because the surgeon, when standing, has enormous power, and as he bends over the patient he bears heavily on the instrument, and unwittingly forces it into the part of the canal I have mentioned. Now, the sitting position is absolutely free from all these objections. However prolonged the operation may be, the surgeon will not become fatigued, and as a matter of course, he will not run the chance of losing his temper or his patience. But the sitting position has special advantages attached to it; it is the one in which he possesses the greatest freedom for imprinting any direction he may desire on his instrument, and, happily, it is the one in which he enjoys the maximum amount of mobility with the minimum of power, and is, therefore, the one position in which he is the least likely to make a false passage. Then, again, when the surgeon sits, and the patient stands, the urethra, instrument, and direction of force exercised by the operator, may all be regarded as in the same horizontal plane, and so placed that he is enabled to carry in his mind's eye a central axis round which he can work, as from a centre, and so examine every point on the face of the stricture when searching for the entrance. If the surgeon adopts the sitting position, I feel convinced that he will in the long run prove a far more successful operator than one who stands, and that he will often succeed where the latter has failed.

Now for the patient's position. He is, as I have mentioned, usually placed on his back, with his shoulders supported and knees drawn up. This position possesses but one advantage, and that is, the patient is less likely to faint than in any other. On the other hand, there is a very serious disadvantage attached both to it and the sitting posture, and that is that they are neither in the same horizontal or vertical plane as the instrument and direction of force, when the surgeon is seated. There is a special objection to the sitting posture for the patient, inasmuch as, if the bladder be distended, or the prostate enlarged, there will be a great alteration effected in the relation of the neck of the bladder to the axis of the urethra; and I have often demonstrated on the living body that catheterism, when impossible in the sitting position, becomes perfectly easy if the patient be extended to his full length. I have, at p. 538, vol. i, of the Lancet for 1871, stated that nearly all strictures are situated at the triangular ligament, and I have there explained the reason. Now I am not aware that there is any evidence to show that the urethral opening in the triangular ligament can be in any way altered by change of position; but it may certainly be said that it is far more difficult to introduce an instrument into a stricture if its mouth be flaccid and mobile. What we desire is fixity, and we shall best achieve this object by placing the patient upright against the wall and stretching his penis horizontally forwards. So situated, we have at last attained all that can be desired; for the urethra, instrument, and direction of force are all in the same horizontal and vertical plane, and our axis of vision will nearly correspond. Thus, therefore, we shall be able to impress on the point of the catheter, when lost to view, any direction we may desire it to seek, and our operation will no longer be an exhibition of blind and unguided force, but a successful demonstration of applied skill.—*Lancet, Feb.* 15, 1873, *p.* 235.

60.—RENAL CALCULUS, GRAVEL, GOUT, AND GOUTY DEPOSITS, AND THE VALUE OF LITHIUM SALTS IN THEIR TREATMENT.

By Dr. A. B. Garrod, F.R.S., Physician to King's College Hospital.

Value of Lithium Salts in certain forms of Urinary Gravel and Calculus.—It is in the treatment of that form of gravel and calculus into which uric (lithic) acid enters as an important element that the salts of lithium are most advantageously employed; but even in other forms it is to some extent useful. Lithium salts, as has been remarked above, possess powerful diuretic properties, and it is a great point in almost every form of gravel to increase the amount of the urinary secretion, for by this means all the substances liable to be deposited from the urine in the pelvis of the kidneys and in the bladder are rendered more soluble, and this remark applies more especially to uric acid and urates; and if the lithium salts are more powerfully diuretic than the corresponding salts of potassium and sodium, it follows that they must act more powerfully as lithontriptics. When administered in cases of uric gravel and calculi their value is the more evident, seeing that the lithate or urate of lithium is so much more soluble than the urate of potassium, and still more so than the urate of sodium. The amount of a lithium salt required to keep the urine neutral, and to hold the uric acid in solution, is much smaller than that of the corresponding salt either of potassium or sodium.

I could give many illustrations of the value of lithium salts in these cases; a few will prove sufficient. A gentleman about 60 years of age was passing at the time he came under my care numerous uric acid calculi—in fact, scarcely a day elapsed without some being seen; besides which, he had previously been operated on for stone in the bladder. He was ordered about five grains of carbonate of lithium twice a day in the form of lithia water, which consists of the carbonate dissolved in water by means of an excess of carbonic anhydride (carbonic acid gas). From the time of commencing this treatment he ceased to pass calculi, the urine remained clear, and his health in all respects improved. I had an opportunity of seeing this patient after he had followed this plan for seven years, and he considered that he had been cured by it, not only as regards the calculi, but in other respects, which will be alluded to afterwards.

Another gentleman, 58 years of age, possessing an hereditary tendency to gravel and gout on the mother's side, was suffering when first seen from great uneasiness in the left loin, the frequent passing of red sand in Cayenne-pepper like grains, and from retraction of the left testicle, &c. The granular effervescing citrate of lithium (a somewhat doubtful preparation) was first given with some advantage, about 60 grains twice a-day; still crystals of uric acid were frequently seen in the urine and some uneasiness felt. Afterwards lemonade was ordered—a pint and a half each day, containing 120 grains of citrate of potassium and 20 grains of citrate of lithium. Under this treatment the patient lost the pain in the side; the urine became greatly augmented in quantity. On five days during the first week of following this plan the quantity was 65, 55, 55, 60, 85 fluid ounces; scarcely any sand was visible, and this probably from the washing-out of old crystals from the kidneys; the specific gravity on one occasion 1023. The saline was then increased by one-half, and the urine taken on three occasions was about 80 fluid ounces; the specific gravity was 1025, 1020, and 1020. The urine was very clear and without sand, and the patient remained free from pain or uneasiness. On omitting the saline the urine became gradually less in quantity, and of higher specific gravity—about 1028—with occasional sand, and pain in the side. On recommencing the above plan the specific gravity was lowered to 1020, and on again omitting the saline it rose to 1030, the patient at the same time exhibiting some of the old symptoms.

It was the opinion of the patient that the large doses of the citrate lowered the tone of the system, and it was then proposed to try the lithia salt alone; 15 grains of neutral citrate of lithium were given three times a day; the specific gravity of the urine was lowered to 1020. When only two doses were taken the urine remained at 1024, and quite free from sand, and not the least feeling of lowering was experienced.

Numerous trials made with salts of lithium and potassium separately led to the following conclusion—namely, that by means of from 20 to 30 grains of citrate of lithium the urine can be kept as full in quantity, the specific gravity as low, and the freedom from sand as great, as from the use of from 120 to 180 grains of citrate of potassium; and that when under the influence of the lithium salt no debility is experienced, whereas the lowering is often well marked when the citrate of potassium is exhibited.

I may quote a third case—that of a lady who had long suffered from pain in the left loin, with frequent passage of small quantities of blood and abundance of uric acid. In this case by the long-continued use of lithium the urine was kept free from gravel and blood, the pain in the side removed, and the general health very greatly improved.

In my case-books there are records of numerous cases illustrating the above statements, and which prove beyond doubt that lithium salts given even in moderate doses are most effectual in preventing the occurrence of uric acid or urate gravel, and likewise the formation of uric calculi; and the only objection to their more extended use lies in the high price of these salts compared with that of potassium and sodium, which does not apply in any marked degree to a large class of patients who suffer from these affections.

2. *Value of Lithium Salts in the Treatment of Gout, and for the Removal of the so-called Chalk-Stones or Gouty Deposits.*—It can be shown beyond all doubt that in cases of true gout uric acid, in the form of urate of sodium, is always present in the blood; it can also be easily demonstrated that when gouty inflammation occurs in any tissue, as in the cartilages of the joints, or the ligaments surrounding the joints, urate of sodium becomes deposited in them; and that frequently this salt, in the form of chalk-like deposits, becomes visible externally, sometimes in the fibro-cartilages of the ears or around the smaller or even larger joints, at the ends of fingers, and in other situations; and lastly, the kidneys are frequently found with numerous streaks of such urate deposits between their tubuli—deposits which have ensued as an accompaniment of gouty inflammation in those organs. This being the case, it would naturally be supposed that lithium salts might prove of advantage in the treatment of both acute and chronic forms of gouty inflammation, and likewise, when administered in the intervals of the attacks, might keep up such a state of the blood as to prevent the occurrence of such inflammatory action.

(*a*) *Lithium Salts as Internal Remedies in Acute and Chronic Gout.*—In gouty inflammation my own experience would lead me to the conclusion that lithium salts possess all the virtues of those of potassium and sodium in an exalted degree, increasing the amount of the urine, and rendering it less acid and free from deposits; but it must be known to all who have been engaged in strict therapeutic inquiries that the difficulty of determining clinically the true value of any remedy in such cases is exceedingly great. At the same time, our knowledge of the high diuretic power of lithium salts, their great alkalinising and solvent powers for uric acid, at once render it probable that their value must be great. In chronic forms of the disease, and in the intervals between the attacks, their value is more readily shown. In the first case above referred to this was well marked; the patient, before he commenced the use of the lithium, was accustomed to be laid up with attacks of gout about twice in the year, but during the seven years in which he was under lithia treatment he was free from gout as well as calculi. Numerous patients have informed me of a similar result having followed a similar plan of treatment. I do not for a moment intend to assert that other means may not, in many cases, be resorted to with advantage, but only that the salts of lithium are very advantageous, given either alone or in conjunction with other remedies. It is a matter of interest, before completing this part of our inquiry, to ascertain if the lithium salts produce any physiological symptoms other than those we have already alluded to; this we will now endeavour to determine.

From an extensive experience in their administration, I may state that in the doses which I have commonly given—namely, about ten to fifteen grains of the carbonate and twenty to thirty grains of the citrate—I have scarcely ever seen evidences of any action otherwise than on the secretion of the kidneys and the condition of the urine; there are, however, well-observed facts which appear to show that some influence on the nervous system is occasionally produced. I have seen two or three cases in which a little tremor of the arms appeared to be induced, but in one of these patients there was a tendency to the symptom even when the drug was not administered. I have been informed that similar symptoms have been noticed by others, but as yet I have neither seen nor heard of any serious effects being induced by their exhibition. It would be interesting to ascertain the physiological effects of larger doses of the lithium salts than those commonly given at the present time. As to the choice of the lithium salts as internal remedies, this must depend on circumstances; it must be remembered that if the carbonate is given it acts as an antacid to the stomach, and increases the alkalinity of the blood, and appears as an alkaline carbonate in the urine; it therefore acts both as a direct and indirect antacid. When a lithium salt with a vegetable acid is substituted for the carbonate, it exerts no antacid property upon the alimentary canal, but appears in the urine as carbonate; hence it may be regarded as a remote, but not as a direct, antacid. Where the change takes place—whether in the blood itself or in the kidneys—we have as yet no data by which to determine the fact; although its determination is by no means without importance, for on it depends the question of the equal efficacy of the citrate and carbonate when the object is to produce an alkaline effect upon the blood. It is usually assumed, and with considerable probability, that the change takes place in the blood itself—that the vegetable acid becomes oxidised in that fluid, or burnt off; and if such be the case, there is often considerable advantage in substituting a citrate or acetate for a carbonate, as the alkaline reaction upon the alimentary canal is often undesirable, especially when the treatment is continued for any length of time. These remarks apply, of course, to all the alkaline salts, and are by no means confined to those of lithium. Of this we may feel sure—that if an alkaline action on the urine is required, a citrate or acetate is equal to a carbonate, provided no aperient effect is produced; that when it is our object to produce an alkaline effect on the stomach, the carbonate must be administered; but that at present it is a little doubtful whether the blood is equally affected by a citrate and carbonate.—*Medical Times and Gazette, March* 8, 1873, *p.* 246.

ISEASES OF THE EYE.

61.—ON CONJUNCTIVAL TRANSPLANTATION FROM THE RABBIT.

By Dr. J. R. Wolfe, Surgeon to the Glasgow Ophthalmic Institution; Lecturer on Ophthalmic Medicine and Surgery in Anderson's University.

[Experiments made upon animals by Dr. Wolfe prove, contrary to the current opinion, that the ordinary secretion of tears for lubricating the eyeball is derived from the conjunctiva, and is not formed in larger quantity than can be got rid of by evaporation.]

When both the conjunctiva of the eyeball and the corresponding palpebral conjunctiva are destroyed by a burn with hot metal, gunpowder explosion, quicklime, or other chemical substances, adhesion or symblepharon is the result. Iron-moulders, puddlers, and labourers in chemical works being most exposed to such accidents, hence cases of symblepharon are numerous in Glasgow. This patient, a foundry boy from Airdrie, came to the institution two days ago for the relief of symblepharon. You see the lower eyelid fixed to the eyeball covering very nearly the whole cornea, the eyeball completely tied down, for even the levator palpebræ, instead of lifting the upper eyelid, drags the eyeball and imparts it an awkward rotatory motion. Vision is completely abolished. This case is highly unfavourable to operative interference.

To cure symblepharon is generally admitted to be exceedingly difficult, if not impossible. Numerous are the expedients which have been resorted to for the cure of that affection. They have all for their object the mechanical separation of the lid and eyeball until the raw surfaces cicatrize. Some operators try to effect this by simply dissecting the adherent lid, and then tearing up the wound daily, for a certain period until it no longer united. Others, again, try to keep the surfaces separate by interposing foreign bodies, as sealing-wax, leather, glass shields, &c.

Dieffenbach's method is the most ingenious. He detaches the lid from the eyeball, shaves the lashes, and then folds the eyelid upon itself, so that the skin comes in contact with the eyeball. He fixes it in this position with sutures until it heals.

After repeated trials of these methods I came to the conclusion that the proper operative method was still to be discovered.

(1.) Repeated tearing of the surfaces is useless. We always found that nature frustrated our attempt of the previous day to keep them asunder. I watched the process very carefully, and noticed that union does not take place by exudation of lymph (as taught by the Vienna School), but strictly according to Virchow's theory—viz., by proliferation of the cells, or, if I may use the expression, by parenchymatous agglutination. There is, therefore, no plastic membrane to tear or tease out.

(2.) The interposition of foreign bodies must appear a vain attempt to any one who has ever tried to insert an artificial eye after dissecting an adherent eyelid. The foreign body is in such cases invariably squeezed out by gradual constriction. Indeed, I may say with regard to these and similar methods, that they are based upon the supposition that a delicate physiological action can be replaced by a coarse mechanical contrivance. Nature, which supplies the organism with lymph, synovia, mucin, and tears for smoothing the various membranes, abhors every motion upon rusty hinges or friction of surfaces. Whenever these surfaces rub upon each other they ultimately adhere.

For the last few years I have practised an operation for the radical cure of symblepharon by plastic operation of the conjunctiva. I take a portion of the neighbouring healthy conjunctiva of the eyeball, wherever I can get it, to supply the palpebral conjunctiva which has been destroyed. For experience has taught me, that loss of conjunctiva oculi, even to a very large extent, is generally regenerated without prejudice to the neighbouring tissues, whilst loss of the conjunctiva of the eyelid is followed by such disastrous results as pannus, ulcerated cornea, &c., &c., above referred to.

Fig. 1 represents the case of Simon M'K., aged twenty, moulder, who, three years ago, had his eye burnt with molten lead, resulting in adhesions of the lower eyelid, which covered the lower half of the pupil. I dissected carefully the eyelid from the eyeball, separating it as far as the *cul-de-sac*, to make quite sure that I had liberated the eyeball completely. I then passed two fine silk threads through each side of the conjunctiva at the outer aspect, which ligatures marked the breadth of the conjunctival flap to be removed. These two I put on the stretch, and with a pair of scissors I first cut horizontally, and then on each side of the ligatures, then putting the scissors behind, I cut it from the eyeball. In cutting the flap on the stretch by means of the ligatures, I take care that the conjunctival flap is removed without any of the sub-conjunctival tissue. The same process is followed at the inner side, and these two flaps are brought together in the middle line, and secured with stitches, as marked in the diagram.

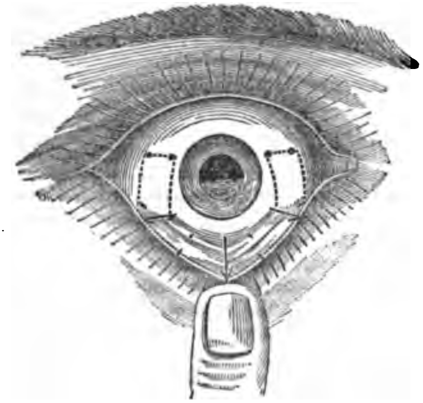


Fig. 1.

The operation was performed in Sept. 1869, and it will be seen that he has the free movement of the eyeball. There is scarcely any perceptible trace upon the eyeball, whence the flaps were borrowed. The cornea only presents some traces of leucoma where the adhesion formerly was, and these latter are also gradually disappearing.

Fig. 2 represents the case of John Muir, aged 15, tinsmith, who burnt his eye with strong hydrochloric acid two years ago, resulting in extensive symblepharon. On presenting himself at the Institution in June last, I found the lower eyelid completely covering the upper margin of the pupil; vision was therefore impossible. The first step accordingly was to make an iridectomy upwards and inwards, and in August last we proceeded to the plastic operation of the conjunctiva.

But it will be seen that the lateral flaps were, in this case, impossible, because the burn extended above the meridian. I therefore took one large flap from the upper hemisphere of the ball, and secured it upon the eyelid as above described.

About three years ago, after I prepared a paper for the press on the subject, I became aware that Mr. P. Teale, of Leeds, published a paper on a similar operation in the Ophthalmic Hospital Reports. Although Mr. Teale's operation differs from my own, yet, such is my repugnance to squabbles about originality and priority, that I did not publish my paper. But having had an opportunity in August last, to explain to the Ophthalmological Congress the nature of my operation as distinct from that of Mr. Teale, I can have no hesitation in referring to it here. Mr. Teale takes "a flap from each side of the conjunctiva, one is stretched across the raw surface of the eyelid, and the other is fixed across the raw surface of the eyeball—thus the two flaps are dovetailed into the wound." It is thus evident that in this operation a large supply of conjunctival tissue is requisite to repair a comparatively slight injury, while in my operation the conjunctiva of the globe is altogether disregarded; the palpebral conjunctiva alone being repaired. Besides, I take my flap from the whole breadth as far as the cul-de-sac, if necessary. The result is that, while Mr. Teale interferes only with a case of symblepharon, "provided it be of moderate extent," my operation is applicable to extensive adhesions, provided there be sufficient transparent cornea to make an artificial pupil, as shown in figure 2.

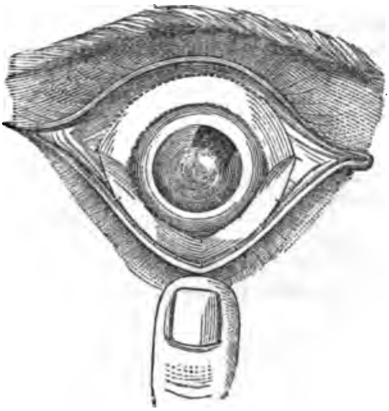


Fig. 2.

This is fully borne out, not only by the drawings in Mr. Teale's paper on the subject, but also by comparing the patients which Mr. Teale brought up to London to show to the Congress with those which I have the pleasure of submitting to the Society this evening.

It is right, however, to bear in mind that there is a limit to the extent to which we may go in borrowing conjunctival substance from an eye which has already been injured. If we surpass that limit, the corneal opacity is sure to extend still further, and we lose the last chance of saving vision. Indeed, we sometimes meet with cases in which the infliction of a new wound amounts to the destruction of the eye. This leads me to speak of the last case which I submit, as it is of peculiar interest:—

Ed. M'In., aged 31, labourer in ironsmelting, Coatbridge, was struck by a ball of red-hot iron in the left eye on the 17th Sept., 1872, which caused the adhesion of the lower conjunctiva and the greater part of the cornea. When he first came to the institution on the 24th September, seven days after the accident, the conjunctiva of the lower eyelid was completely destroyed, and the corresponding conjunctiva of the eyeball—the whole conjunctival sac was in a state of serous chemosis, and the greater part of the cornea burnt. Emollient applications were used. After a week's stay in the institution he was sent home to come back when the swelling had subsided. He returned five weeks ago. On examination, the lower eyelid was found completely covering the cornea above its upper pupillary margin, the eyeball quite fixed by the upper and lower eyelids, and sunk in the orbit. On lifting the upper eyelid with the finger the sclerotic was seen as it were receding, and no dragging upon the eyeball could turn the upper border of the cornea sufficiently forward and downward even for making an iridectomy. The attempt to take a conjunctival flap from the upper hemisphere of the eye, as done in the previous case, was altogether out of the question, for there was no room to manipulate either with scissors or bistoury. Indeed, it was pretty certain, considering the narrow strip of transparent cornea, that its opacity would certainly have ensued, even if section at its periphery had been practicable.

I was about to give up all idea of surgical interference, when it occurred to me, that I might give the patient some chance by supplying him with conjunctival substance from a rabbit.

I would request the gentlemen present to take a careful view of this patient. You see that both eyes are naturally too deeply set. The upper hemisphere is set too closely behind the roof of the orbit. You will notice, therefore, that owing to the natural formation of the parts the portion of the cornea which escaped destruction could not be turned into account. Besides, seeing the narrow strip of transparent cornea left, to have removed a conjunctival flap from its vicinity would have resulted in rendering even it opaque.

Fig. 3 represents the eye before the operation, the upper eyelid being raised to show the portion of the cornea which escaped the burn.

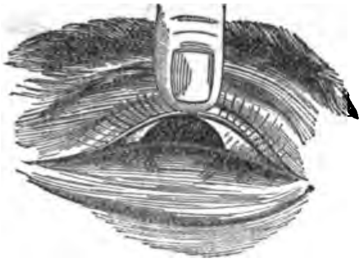


Fig. 3.

The operation was performed on the 3rd November in the following manner:—Both patient and rabbit being put under chloroform, I separated the adhesions so that the eyeball could move in every direction, and everting the lower eyelid and turning it downwards, I took from the rabbit that portion of the conjunctiva which lines the inner angle, covering the *membrana nictitans*, and extends as far as the cornea, the portion to be removed having been previously defined by four fine silk threads, which enabled me at the same time to transfer it quickly to replace the lost conjunctiva palpebræ of the patient, in which place it was secured with stitches as shown in *Fig.* 4. I take this portion on account of its vascularity and looseness. The eye was covered with a bandage and dry lint.

Next morning, Nov. 4, the eye was found tolerably quiescent. The whole conjunctival sac was not more inflamed than was to be expected would result from the extensive dissection and from the presence of ligatures. The transplanted conjunctiva had a greyish look. Ordered warm fomentations.

Nov. 5. Complains of great pain and lachrymation, wound more tender. New conjunctiva lost its greyish appearance with the exception of isolated patches here and there, the rest is swollen and glistening, and in some parts looks not unlike exuberant granulations. Ordered warm fomentations, with vin. opii, and belladonna, and strong purgatives.

Nov. 6. Swelling subdued. The grey patches decreased to two in number, and these are very small, about the size of a hemp seed.

Nov. 7. Appearance of the eye improving, irritation subdued. The new conjunctiva red and adherent. I removed the ligatures, after which the eye continued to improve. Patient remained in the hospital for a week, during which time he was carefully noted by me, assistant, and students. The eyelid remained separated through its whole extent, the eyeball movable in every direction, while the transplanted palpebral conjunctiva retained its vitality, as shown by its red appearance and comparatively smooth surface. There was only one gray spot, the size of a pin's head, visible. Was dismissed on the 11th Nov. He returned three days ago, last Tuesday, Dec. 3. The eye was found in a satisfactory condition. The conjunctiva has a healthy look, the free motion of eyeball maintained, which enabled me at once to make an artificial pupil, which is also shown in Fig. 4.

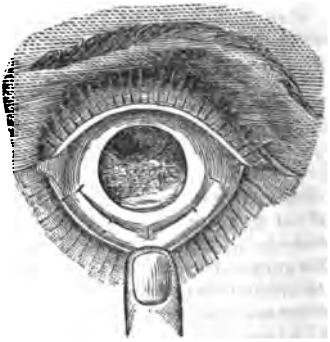


Fig. 4.

Here, then, an eye which had been rendered immovable and totally blind by disorganization of its conjunctiva, and the greater part of the cornea, and owing to the natural formation of the parts as well as to the extent of the loss of the tissue, even the portion of cornea which escaped could not be turned to account, has, by this new procedure, been rendered a useful organ, the eye being moveable in every direction. He reads No. 16 with the new pupil made three days ago.

Our first attempt in this direction being thus encouraging, I think I am justified in saying that, if further experiments should establish the adoption of this method, we would not only possess a valuable expedient for curing an affection which has hitherto been deemed incurable, but I would consider it as an important step towards a greater surgical achievement, namely, corneal transplantation.

There is a large class of patients in blind asylums and elsewhere whose eye tissues are perfectly healthy with the exception of corneal opacity. Now, the question is, shall we ever be able to supply them with transparent corneæ by transplantation? All attempts formerly made in that direction have failed on account of the impossibility of measuring the size of the flap. Mr. Power, of St. Bartholomew's Hospital, London, informed me last spring that he was engaged in corneal transplantation from the rabbit. Indeed, in August last, he exhibited to the Ophthalmological Congress a case which was so far successful that the cornea from a rabbit grew upon that of a child, but, unfortunately, it was opaque. Mr. Power informed me of one case, namely, that of a soldier in which the transplanted cornea kept its transparency for about six weeks. Now, it appears to me in experimenting with these instruments which Mr. Power kindly sent me, that the occasion of its becoming opaque may be partly owing to the isolation of the corneal flap from the neighbouring tissues, for Mr. Power's instrument removes a complete corneal circle. Our chance might be improved if we could make a cornea-conjunctival flap. Here is an instrument made for me by Mr. Hilliard, consisting of two revolving lancets, moving within a cylinder, and of two picks to fix the eyeball. The lancets cut the larger segment of a circle, leaving a corneal bridge. From this point the corneal incision is further carried on with a narrow knife, and prolonged to the conjunctiva, the conjunctival portion having previously been prepared by dissection. The conjunctival portion will not only give the cornea a point of attachment, but render it less isolated, and improve its chance of vitality. The first thing therefore to ascertain, was whether the conjunctiva would live. Seeing now, as this case shows, that conjunctival transplantation is feasible, we have an important point gained.

In answering, therefore, the question put above, I can only say that we are nearer to the point we are aiming at, to-day than we were yesterday.

Since the above went to press, I have had another successful case of conjunctival transplantation from the rabbit, which goes far to confirm the views expressed above, for it is not merely a repetition of the same method, but a new element has been introduced with the view of checking the result obtained on the former occasion.

Peter C., Furnace Quarry, Argyleshire, received an injury upon his face and eyes from a gunpowder explosion when blasting rocks, fourteen months ago. When he first came to the Institution, four months after the accident, his face was quite riddled and discoloured by the powder. Both upper and lower eyelids of the right eye were considerably everted, and the left eye was completely closed and blinded by a symblepharon analogous to fig. 2. I made an iridectomy upwards, which resulted in a little sight when the upper eyelid was raised. On his returning this time to seek further relief, I thought it expedient to resort to our new method. I performed the operation, assisted by Mr. Nairne and Mr. William M. Campbell, as on former occasions, on the 23rd Jan. The conjunctival flap from the rabbit I made larger than was requisite to supply the palpebral conjunctiva. It was fixed with stitches as before, but instead of cutting off the superfluous portion, I left it attached. In examining the case daily, in the presence of the gentlemen above mentioned and our students, that loose portion indicated clearly to us, beyond any possibility of mistake, the vitality of the transplanted portion. Whilst it remained greyish, we could notice the gradual changes which the fixed portion was daily undergoing; and on February 3, nine days after the ligatures were removed, the loose portion was st floating upon the conjunctiva a greyish flap, whilst the fixed part had alm entirely assumed a shining appearance.

During the whole course of treatment the eye was quiescent, there was neither pain nor lachrymation, and I may say that it united by agglutination. Free motion and improved vision have been established; and although this case was not so aggravated as the last, yet it may be regarded as a corroborative instance of the efficacy of the operation.—*Glasgow Medical Journal, Feb.* 7, 1873, *p.* 200.

62.—PRACTICAL REMARKS ON THE TREATMENT OF CATARACT.

By G. Critchett, Esq., Senior Surgeon to the Royal Ophthalmic Hospital.

[The numerous articles published upon cataract, show that opinions as to the best form of operation for cataract are very unsettled.]

The questions upon which the chief differences of opinion exist amongst ophthalmic surgeons have reference chiefly, 1st, to the size, form, and situation of the wound; and, 2ndly, to the performance of an iridectomy.

As regards the size I think it will be generally admitted that in old persons with hard fully-formed cataracts, it should be of sufficient extent to allow the exit of the lens without force. In respect to form, it should be curvilinear, representing a segment of a circle about double the size of the circumference of the cornea. Upon both these points there is probably considerable uniformity of opinion amongst operators. The two next questions, viz., the tissue in which the section should be made, and whether an iridectomy should be performed, involve considerable differences of opinion. As regards the tissue, we have to determine whether the section shall be in the cornea or in the opaque white tissue that constitutes the border land between the cornea and sclerotic (a structure that varies much in extent in different subjects), or whether the two extremities of the wound shall be in the white fibrous tissue, and the central part in the transparent cornea. At first sight this may seem like hair-splitting, but in reality it involves an important principle. Some contend that one of these tissues unites with greater rapidity and certainty than the other, and to determine this, extensive and carefully drawn statistics are required. It is generally acknowledged that the cornea is much more prone to take on suppurative inflammation than the opaque tissue, and that "cæteris paribus" a wound of this latter heals better than in the cornea. As a proof of this we may appeal to the ordinary operation of iridectomy, which, so far as the operation is concerned, enjoys a remarkable immunity from risk, large statistics showing a loss of not more than one in five hundred cases. A similar wound inflicted on the cornea would give far less favourable results. The fair inference from this would seem to be that if we could limit the section exactly to this opaque tissue, making it of such a form and size as would permit of the free exit of the cataract, we should obtain more favourable results than in a corneal wound, and I am disposed to think this is correct; but there are certain risks in this operation that it is well to consider. They are chiefly three—1st. Greater liability to escape of vitreous humour; 2nd. Proneness to secondary iritis; and 3rd. *Possibility* of sympathetic ophthalmia. The reason of the first of these accidents is usually some spasm and pressure at the moment of the exit of the lens, or a long residence of the cataract in the eye, involving toughness and opacity of the capsule, atrophy of the ciliary ligament, and a fluid state of the vitreous humour. Secondary iritis usually depends upon some bruising of its tissue at the moment of exit, or some fragments remaining in the pupillary area, or a constitutional proneness to fibrous inflammation after wounds, aggravated by entanglement of the cut angle of the iris in the wound. Sympathetic ophthalmia (fortunately an exceedingly rare occurrence) is probably due to an encroachment of the section upon the ciliary nerves, and a consequent bruising of that highly sensitive tissue, during the transit of the hard cataract. All three contingencies may be usually avoided when they are fully recognised—the chief source of danger being not so much the seat of the wound as *the point of puncture and counter-puncture;* these being very liable without care to encroach upon the ciliary region. In order to avoid this, a greater curve may be given to the wound, so as to make it represent a larger segment of rather a smaller circle, in such a manner that the puncture, the counter-puncture, and the remainder of the wound are in the opaque tissue close to the cornea, and at a safe distance from the ciliary ligament, exactly in the situation where iridectomy is performed, It may be argued that in this way we are departing too much from the curvilinear and returning to the semi-circular form of section, but although this may be in some measure true, it is unimportant when combined with iridectomy, and when situated in this opaque fibrous tissue, in which the edges keep well together and are generally aided by a conjunctival flap. I believe that in a majority of cases this method of operating, if carefully carried out in all its details, will give the best results, and has many advantages over a corneal operation. Under the most favourable circumstances, however, the warmest advocates of this method must admit, as an inevitable result, the permanent mutilation of the eye by the loss of a portion of the iris, the frequent occurrence of opaque capsule, and a certain amount of irregular astigmatism. In stating the case for curvilinear extraction with iridectomy, as finally bequeathed to us by Von Graefe, and in advocating its advantages I have only claimed for it a majority of average cases, and I should entirely fail in carrying out the objects of this paper were I not to put in a plea for the corneal section.

There are many who prefer the operation of Graefe with the modification of a corneal instead of an opaque fibrous section, limiting the fibrous part to the puncture and counter-puncture. Time and large experience can alone determine this point. It seems to me that such an operation retains the objections and misses some of the advantages of the Graefe method. If the puncture and counter-puncture are beyond the limits of the cornea, the danger is not increased by making the remainder of the wound in the same tissue, so long as it be not permitted to encroach upon the limits of the ciliary region. If, therefore, it be determined to adopt the corneal section, it seems to me that the operation described by M. Warlomont offers strong arguments in its favour. The section is curvilinear, it is made entirely in the corneal tissue by means of the needle knife, it is nearly painless, and may be performed without the use of an anæsthetic; it is comparatively easy of execution; it does but very little violence to the eye; it is seldom attended with prolapse or synechia; and if it quite succeed, leaves the eye with a circular small pupil, an almost invisible cicatrix, and good optical conditions. Secondary capsular opacity is rare. I should advise this method of operating to be preferred in every case to the old flap operation, which I think should now be altogether abandoned. It seems to be indicated in the following cases—1st. Wherever the modified linear extraction has failed in one eye; 2nd. Wherever both eyes are operated upon at the same time one should be treated by this method; 3rd. Whenever the patient is unable or unwilling to take chloroform; 4th. In persons but little past middle age, in whom the cosmetic result is important, and where it is desirable to obtain the highest optical effect; 5th. Where the cataract is not quite mature, and likely to be sticky, or to leave fragments behind; 6th. In cases where distance renders a secondary operation for the division of capsule difficult or even impossible; 7th. Where the anterior chamber is small and the circumference of the iris is close to the cornea, so as to preclude a satisfactory curvilinear section through the opaque tissue between cornea and sclerotic. The objections and sources of danger in this method are the same in kind though not in degree as the old flap operation. There is—1st. The risk of suppuration of the cornea or even of the globe; 2nd. Prolapse of the iris, though in consequence of the curvilinear form of the wound this is of necessity small and easily dealt with, and not incompatible with very fair vision; 3rd. There is anterior synechia—the iris may fall forward and attach itself to the edges of the corneal wound. This, of course, mars the perfection of the eye, but leaves a clear pupil and a good optical result. Whilst I am far from believing that this operation will ever supersede the one known as that of Von Graefe, it commends itself strongly in those cases indicated above, and, if judiciously selected, will diminish our average of failures.—*Medical Press and Circular, Dec.* 18, 1873, *p.* 517.

63.—THE REMOVAL OF CATARACT BY SOLUTION, ESPECIALLY WITH REGARD TO THE SOFT CATARACT OF EARLY LIFE, AND THE OPERATION BY KERATONYXIS.

By Dr. Archibald Hamilton Jacob, Chief Surgeon to the Dublin Eye and Ear Infirmary; late Ophthalmic Surgeon to the City of Dublin Hospital.

The operation for Keratonyxis, or the breaking up of the cataract with a needle passed through the cornea, was one with which Dr. Arthur Jacob's name and practice were intimately associated, and the result of his very lengthened experience was, that he applied the process to almost all forms of cataract—even those to which it would be now considered inapplicable—and attained great success in its use. In the year 1827 he published his first communication on the subject (Dublin Hospital Reports, vol. iv., page 214), and he followed up the subject by a contribution to the Medical Press in the year 1850, and the strength of his views, founded on the experience of these twenty-three years, may be best appreciated from the following quotation of the last words of this communication. Having cited the result of a number of his operations, Dr. Jacob said:—

"From these cases the surgeon can form some opinion as to the practical results of the operation. They present the general effects of the practice, and certainly do not afford more favourable examples than an average would supply. I have no wish to indulge in any exaggeration respecting the success of this method. I am writing for surgeons who will, in the sequel, pronounce a verdict upon it from their own experience, and thereby verify or disprove my statements. . . . . I refrain from performing the operation for extraction, only because it is in its nature a most formidable operation, and in its results a most hazardous one. In principle, too, it is not creditable to surgery. To cut open a man's eye in order to squeeze out his crystalline lens through the incision, when that lens can be removed by absorption, I hold to be contrary to the rule which binds the surgeon to give his patient the best chance of recovery, regardless of present inconvenience or delay. But, whatever view may be entertained on this subject, I am firmly convinced that the operation of extraction should be restricted to hard cataracts in aged persons. Under fifty years of age, the crystalline lens once broken in pieces must be sooner or later dissolved and absorbed. There can be no question as to the result; it is only a question of time."

Heterodox as these views may appear to modern ophthalmologists, I do not hesitate, a quarter of a century after their enunciation, to declare my adhesion to their principle, and my entire concurrence in the justice of the comparison which Dr. Jacob then drew between the operations for extraction and solution. In the majority of cases I myself operate by extraction, with the feeling that my doing so is a concession to the convenience of the patient, and that I thereby purchase a comparatively rapid restoration of sight at the expense of a very grave risk of failure, and a certain inevitable sacrifice as regards the ultimate result. I am perfectly pursuaded that in *all* cases, excepting those of hard amber cataract of old age, it would be my duty to advise the operation of solution in preference to that of extraction, if the patient were content or able to wait for the result. I do not consider that, since Dr. Arthur Jacob penned these observations, any of the infinite modifications of the extraction operation have very materially improved its safety or efficiency, or have brought it at all into competition with keratonyxis in these qualities, and I, therefore, hold that spoon operations or other procedures recommended for the immediate removal of soft, rapidly-dissolving cataracts, are, unless under very exceptional circumstances, as unjustifiable as they are usually unsatisfactory. In thus expressing my very strong predilection for the operation by solution, I hope I shall not be understood as unqualifiedly condemning the extraction operation, which I have no hesitation in performing very frequently, and in which I think I have a fair measure of success. I desire only to imply that the supremacy of that procedure is the result, not of its surgical perfection or satisfactory effect, but of its greater adaptability to the convenience of the patient. Very many people must be content to incur risk and prejudice results for the sake of their own private reasons, and in such case the operation must be and is performed with usually the best effect. But, in my opinion, no ophthalmic surgeon would be justified in advising extraction until he had satisfied himself that solution was, from the unsuitability of the case or the necessity for haste, out of the question, and the temptation to a brilliant operation or the desire to satisfy the fidgetiness of the patient, ought not to deprive the alternative operation of its due consideration.

I have stated that "in the majority of cases I operate by extraction, with the feeling that my doing so is a concession to the convenience of the patient, and that I thereby purchase a comparatively rapid restoration of sight at the expense of a very grave risk of failure, and a certain inevitable sacrifice as regards the ultimate result. I am perfectly persuaded that in almost *all* cases of true cataract, hardly even excepting those of hard amber cataract of old age, it would be my duty to advise the operation of solution in preference to that of extraction, if the patient were content or able to wait for the result."

In making this exception, however, I do so, not because a hard senile cataract is incapable of being resolved by the operation of division, but because the lengthened period which is required for complete solution goes somewhat to justify the more riskful operation of extraction. Cases of hard amber cataract may present themselves, in which an excision operation is not admissible, in consequence of some constitutional fault in the patient, or in which the patient is content to wait for the result rather than encounter the risks of the extraction operation, and it should be remembered that in such cases restoration of sight is quite feasible if the patient will wait some months for the result. About three years ago an old lady of seventy-four consulted me as to the removal of her cataracts, which were of the usual dark-coloured waxy type, and fully developed in one eye. She was the victim of constant and prolonged attacks of bilious vomiting, which it did not appear could be controlled, and was, moreover, in such a state of health that confinement to bed, or prolonged suffering, might probably be attended with much risk to life. I advised her that none of the speedy methods of removing her cataract were available in her case, but gave her the alternative of an operation for division, assuring her that most probably she would be no worse a week after the operation than she had been before, and that she might confidently hope for restoration of vision within a year. I operated on that lady's lenses, which were as hard and waxy as I ever met, and after three repetitions of the operation, none of which were attended with any ill effect whatever, she was rewarded by a perfect recovery, and she now sees perfectly well. Late writers have expressed themselves as if they held the opinion that not only was the absorption of a hard senile cataract tedious, and, on that account, the division operation inapplicable, but that such a method of treatment was totally out of the question in old persons. I desire, if possible, to remove this misconception. I have seen in my father's practice many, and, in my own, a few hard amber cataracts removed without risk or discomfort, by one or two insignificant operations.

The extreme slowness of absorption, and the necessity for repeated disturbance of the eye in a person advanced in life are, however, sources of inconvenience and risk which justify the selection, as a rule, of the more hazardous operation in cases of hard senile cataract, and I quote the foregoing case to show that under exceptional and even very unfavourable circumstances, the cataract of old age may be removed by division, and will dissolve even after a single breaking up, if abundance of time be allowed for the process.

There are several forms of capsular or lenticular disease which are included under the name of cataract which are not amenable to the absorptive treatment, and cannot, therefore, be included in the favourable opinion of that method to which I have given expression. These are:—1. The calcareous or osseous cataract; 2. The pyramidal; 3. Extensive capsular opacities; and 4. The false or cheesy cataract which arises from the deposit of products of inflammation upon the surface of the capsule or within the pupil.

If, indeed, the capsule be to a considerable extent involved in the disease, or if it is adherent to the iris to such extent as to make it a matter of difficulty to detach it and displace it from the field of vision, it is probable that a subsequent operation may be necessary for its removal. In a former communication I have described the necessary procedure for that purpose, which, if it cannot be dispensed with, is neither difficult nor dangerous; whilst if the capsular opacity be slight, there will be no difficulty in getting rid of it by displacing it with the needle during the operation of division. The calcareous, or, as sometimes described, the osseous cataract, is a not infrequent result of chronic degenerative inflammation, and is formed by the deposition of calcareous matter on the exterior of the capsule, sometimes of both the anterior and posterior surfaces. Rarely also the tendency to true osseous deposits which results in the laying down of bony plates on the surface of the choroid, is said to determine similar formations in the lens. I have recently extracted a calcareous mass formed of an anterior and posterior plate corresponding to the front and back capsular surfaces, and connected by a network of calcareous trabeculæ, the interstices of which were filled up with softened lens matter.

A lens which has undergone calcareous degeneration can obviously be disposed of neither by division nor displacement, not being susceptible of absorption in the one case, and from its weight and irregular form, very unsuitable for depression or to be permitted to remain as a foreign body within the fundus. Being the product of chronic deteriorative inflammation, it is usually accompanied with a fluid vitreous humour and other sequelæ, such as would make the extraction operation riskful, and the benefit derivable from it doubtful. In the case of which I have spoken above the retina turned out to be faulty, and but slight improvement was achieved.

The pyramidal cataract is an extremely rare form, and bears the appearance of an elongated cartilaginous pyramid fixed firmly on the anterior surface of the lens. It is considered by Stellwag to be identical with the more common central opacity of the capsule, except that the deposited matter is built up by successive layers behind, and is pushed forward into a pyramidal shape through the pupil. A single and very remarkable case of this disease came under my notice two years ago, in a child in which both pupils were occupied by two white cartilaginous looking cones, one somewhat longer than the other. In the natural state, the pupil, which was abnormally contracted, was entirely occluded, and there was hardly any sight; but on dilating it, the base of the pyramid appeared to be the only opaque spot on the capsule. Having introduced a cataract needle through the cornea I found the pyramid perfectly hard, and, on a little pressure, it became detached from the lens and fell into the anterior chamber, whence I was obliged to remove it by a small incision. Within a few days the entire lens became cataractous, evidently in consequence of laceration of the capsule and admission of the aqueous humour, and it was afterwards successfully removed by keratonyxis. I think this proceeding, though involuntary in my case, would be safer than proceeding to extract in the first instance.

Extensive capsular opacities, with or without lenticular cataract, frequently cannot be treated satisfactorily by division without subsequent removal of the capsule. Nevertheless, I have usually treated them by that procedure in preference to linear extraction. I have found that the needle may be used with great freedom in such cases, because the capsular sac is tougher than usual, and if it be freely torn in all directions it will generally shrink out of the field of vision, and when the lens substance has been dissolved will leave a good open pupil and almost perfect vision. Secondary cataracts in such cases seldom give trouble, because, as no adhesions to the iris exist, the capsule has not been prevented from retracting up towards the canal of Petit.

A peculiar and unusual form of the capsulo-lenticular cataract is the fluid cataract or *cataracta lactea.* In it the entire lens substance breaks down into a chalky fluid which is enclosed in the complete capsule which, in itself, is commonly a network of opacity. The fluid cataract is not difficult to distinguish, and on piercing it with the needle the milky contents are evacuated, filling the anterior chamber and completely obscuring the patient's sight and operator's view. In a couple of days this milky *débris* will be absorbed, and the capsular network will be seen *in situ.* The pupil may be cleared of this obstruction either by a liberal use of the needle at the time of the evacuation, or by a subsequent operation. The central cataract is a peculiar form in which the opacity is confined to the nucleus, and to a few fissures which extend to the periphery, but does not differ in any respect from the ordinary capsulo-lenticular form. All the foregoing forms, which are usually congenital or occur in early life, are eminently suitable for the absorption treatment, and they may be dealt with by division through the cornea without the least hesitation, yielding results almost always better than those given by linear extraction and spoon operations, and being, at the same time, attended with little or no risk.

The soft stellate cataract, which is ordinarily developed between the ages of 35 and 50, is still more adapted for the operation of division, because it is seldom accompanied by any capsular opacity.

In the selection of a case for extraction, the point on which I would particularly dwell is, that we should be quite certain that the solidification of the lens is complete in all its parts. This is a precaution which, perhaps, does not receive as much attention as it deserves. When an operation has been once decided on, the patient, especially if he is a business man, is usually anxious to have it over, and the surgeon may be himself disposed to close the matter at once. I think it is of great importance that this temptation should not be yielded to, for I have found that, as a rule, a case in which any part of the cortex has been soft and immature, has turned out to be troublesome in the operation, and not satisfactory in its result. The leaving of scraps of cortical cataract in the anterior chamber is, I believe, one of the most fertile causes of secondary iritis, and I have seen cases in which failure of union in the flap has been attributable to such cases. Moreover, in the case of an immature lens, abundant fragments frequently remain in the capsule after the escape of the body of the lens, and becoming opaque, give rise to secondary cataract.

It is easy to make sure that no such fragments occupy the pupil, but hardly possible to detect them when hidden in the angles of the anterior chamber, where they will be likely to do much mischief. All authors advise such fragments to be removed with the scoop; but although I concur in the necessity of doing so when they can be found, I object very much to the introduction of an instrument into the eyeball at the risk of bruising the iris, and disturbing the vitreous, if such procedure could be avoided. I, therefore, never attempt an extraction until I have fully dilated the pupil, and satisfied myself as far as possible that the circumference of the lens is thoroughly opaque, and I rarely fail to find the pupil quite black and clear when I make my examination previous to closing up the eye after operation.

I always operate on the left eye from the front of the patient, and I do not believe in an adroit incision being made with the left hand, except perhaps by a left-handed person. Mr. Wolfe, of the Aberdeen Infirmary, says he always operates so, and it has been the boast of some operators that the vastness of their manipulative experience has enabled them to acquire a marvellous sleight of hand for this purpose. I confess that I do not find it too easy to make a flap of the exactly correct size, in the exactly correct place, without injuring the iris, and I should be very sorry to risk my patient's eye for the sake of displaying my cleverness in manipulation. On this point Mr. Haynes Walton says:—"It is notorious that extraction in the left eye is much more frequently attended by failure than in the right, and the occurrence is, of course, attributable to the greater difficulty offered by the position of the eye." Excepting the temptation to an operator to display manual dexterity, I know of no reason for such failure in left eye extractions, nor do I think that there is any "difficulty offered by the position of the eye." If the patient be placed lying quite close to the side of the table, I think the operation from the front will be found as convenient as that from behind.

I have recently stated at the Surgical Society that, until I have occasion to change my mind, I shall never attempt a capital eye operation without the use of ether, and I repeat here that I do not think any operator will in future be justified in attempting to extract without its help.

The older writers on ophthalmic surgery, including Mackenzie and Lawrence, give minute directions for the steadying of the eye by the fingers, and the method which is now usual of fixing the globe with a forceps is not mentioned by them. On the other hand, some of the writers of the present day, including Stellwag von Carrion and Soelberg Wells, mention fixation with the forceps as an operation. I consider perfect stability of the eye and the alternative which may be dispensed with by the skilful maintenance of a pressure to counterbalance the force necessary for puncturing the cornea, are essential to the making of a good flap, and as I know of no efficient means of obtaining such a condition, except the fixation forceps, I always use it to steady the eye. Mr. Soelberg Wells says:—"The chief difficulty of operating without fixation is that the eye may roll swiftly inwards directly the puncture is made, or even before, so that the cornea becomes almost hidden in the inner canthus, and the knife has to traverse the anterior chamber and make the counter-puncture, without the operator being able to see its course. This will prove extremely embarrassing to the beginner, and may even unnerve him for the remainder of the operation." This opinion perfectly coincides with my own experience, and having at first always operated by steadying the eyeball with my fingers, I now never attempt to do so without fixing it firmly with the forceps. I confess I do not like the idea of lacerating the conjunctiva, however slightly, as this method cannot fail to do, but I cannot say that I have ever seen any subsequent ill result from the practice, and if I did I should, nevertheless, consider that the advantage of immovability of the eyeball during the operation would abundantly repay the risk.

The ordinary fixation forceps I have found very ineffective. Its bite is very minute and very sharp, and it is liable to tear away from its hold on the conjunctiva just at the moment when its services are most wanted; I have, therefore, obtained from Paris a forceps which takes a wider and more effective grip, and inflicts upon the conjunctiva no injury of more moment than a contusion. Mr. Soelberg Wells, Mr. France of Guy's Hospital, and others, direct the eye to be seized a little below or above the cornea, according as the section is to be made above or below. Mr. Macnamara, on the other hand, advises the hold to be taken close to the equator of the eye, and internal to the cornea. I think the latter method of fixation is much the best, for I have found that if the hold be taken below or above, the position of the operator's hands is awkward, and the eye rotates more or less on its axis when the pressure of the puncturing knife is applied to it. My own rule is to seize the conjunctiva immediately above the spot where I mean to make the counter-puncture, and thus I not only keep my left hand out of the way, but I have my fixed point directly opposite to the point of entry of my knife, and the exact place for my counter-puncture is marked for me.—*Med. Press and Circular, Dec.* 18, 1872, *Feb.* 5 *and* 19, 1873, *pp.* 524, 105, 153.

64.—SECTION OF THE ORBICULAR MUSCLE AND INTEGUMENT AT THE OUTER CANTHUS, AS A PRELUDE TO THE EXTRACTION OF CATARACT.

By Edwin Chesshire, Esq., Senior Surgeon to the Birmingham and Midland Eye Hospital.

Before operating for extraction of cataract, I have recently been making a section at the outer canthus through the fibres of the orbicular muscle and the integument; and I have found so much advantage from the proceeding, that I wish to submit the plan to the notice of my professional brethren, in order that it may be more fully tested. I have done five extractions on this method at present, and in every case complete success has resulted.

The advantages attending division of the orbicular muscle at the outer canthus, before making the corneal section, are, more extensive exposure of the globe, which enables the operator to manipulate his instruments, and to make his section through the cornea with greater ease. And the spasmodic contraction of the orbicular muscle being overcome, the operator is left to complete his operation at his leisure; while all risk of sudden protrusion of the lens, followed as it sometimes is by prolapse of the iris and escape of the vitreous, is almost entirely avoided; and the contraction of the lids on the globe, which is sometimes a troublesome symptom in the after-treatment of cataract-extraction, is prevented.

With division of the orbicular muscle, the wire speculum, which greatly facilitates each step of the operation, may be used without injury or annoyance to the patient. No sutures are required, as the divided surfaces readily unite, and scarcely leave a trace behind them. All that is necessary to be done is to keep the eyelids nicely in apposition for a few days after the operation by means of strips of court-plaster. All bandages and other coverings after extraction are to my mind objectionable, as it is important to have the fullest opportunity of examining the appearance of the lids without disturbing the patient by the removal of external appliances. Moreover, the support afforded by the lids to the corneal flap, when nicely kept in position by strips of court-plaster, is very agreeable to the patient. Spasm must be brought on, and the partially healed corneal flap may be opened, by the removal of bandages, wool, &c., which may have become adherent to the lids.

The operation is done as follows. A wire speculum is placed between the lids, to enable the operator to make his section through the muscle and integument at the external canthus with precision and ease. I have made no allusion to the mode of extracting, as the plan I propose is equally applicable to all extractions. Suffice it to say, that I always use Graefe's knife; and that Graefe's or Liebreich's operations are selected, as may appear most suitable to the particular case. I never use chloroform or ether in extraction, as the sickness which frequently follows their administration far outweighs any advantage that may otherwise result from the use of anæsthetics during the operation; and with the orbicular section, the globe being more under control, they are still less required. Where great neatness is required, the section may be made subcutaneously.—*British Medical Journal, April* 5, 1873, *p.* 369.

AFFECTIONS OF THE SKIN.

65.—ON A NEW METHOD OF TREATING ULCERS.

By Philip Cowen, Esq., Resident Medical Officer, Islington Workhouse Infirmary, Upper Holloway.

[The number of ulcers of the leg occurring in a workhouse infirmary must be, under the use of the ordinary lotions and ointments, exceedingly tedious to the medical officer.]

It occurred to me on reflection that, from whatever cause arising, whether constitutional or local, an ulcer could be considered as a local asthenia of skin and parts beneath—a local weakness and loss of plasticity, a brittleness where softness, elasticity, and pliancy, yet strength should exist, a local tendency to degeneration and death. Whether the cause was from venous varicocity, or blood-pressure from other causes, as indolence, or disease of the liver or heart, or from general decay of the tissues from intemperance or other enfeebling vices, or from senile decay, or want of food, or general feeble constitution, or from scrofula or syphilis; from any of these causes the ultimate result is, in an ulcer, the weakening and giving way of structures whose normal condition is to act as covering and protecting sheaths.

In several of these cases the skin is specially weakened, in others gives way through pressure; and in all cases the skin of the legs, from its depending, weight-bearing position, suffers the most. Knowing, as we do, that an ulcer has power of absorbing matters applied to its surface (anyone can try the experiment with blackwash to a moderately sized ulcer for a few days, when mercurial salivation will begin), it occurred to me to avail myself of so excellent a property by applying locally matters having nutritive powers, so that the skin might be nourished locally at the weakened and degenerate spots, to enable the skin to take up such materials as would nourish its weakness and convert its brittle state into a plastic and healing one.

The natural secretion of an ulcer, the so-called laudable pus, may it not be a nourishing juice specially thrown out to feed the young growing granulations? If so, can we not add to this by artificial manuring?

Such is the theory; and I beg to record what has been the result of the practice. To carry it out I made the following mixture of glutinous ingredients:—Flour, four ounces; powder of acacia, one ounce; powder of tragacanth, half an ounce; one egg; chalk, two drachms; cold water, one pint. These were all mixed together, and placed on the fire in a saucepan. Just as it began to boil, or after boiling a minute, it was removed, and allowed to cool. If found too thick, it was made thinner by adding a little boiling water, and stirring, so that it was of the thickness of ordinary paste; thin enough to be spread over the ulcer by means of a little brush, yet so thick that it will remain on the ulcer. Probably such a mixture is not necessary; either the flour-paste alone, or the acacia, might be sufficient; but I prefer it as it stands. The patient, provided with a pot and brush, thickly paints the ulcer all over three or four times daily, and covers the ulcer with a thin piece of soft rag. No other treatment nor washing is had recourse to, except to remove the rag. To keep the materials sweet, only sufficient is poured into the patient's pot for the day (pot and brush washed daily). The flour, acacia, tragacanth, and the egg, supply the ulcer with all the necessary materials for its repair; the chalk has a further good effect, by supplying lime.

Now as to the results. During the six weeks I have tried the remedy, eighteen cases have been so treated—in fact, almost all the cases of ulcer we have had.

G. G., aged fifty-seven, a drinker. Admitted August 13th. Leg ulcer, three months, nearly size of palm of hand. No previous treatment. Applied the paste directly he was admitted. All healed in three weeks.

W. W., aged fifty-seven; degenerate body. Two small ulcers, one on each malleolus; eight months; nothing would heal them. Paste applied; rest in bed. Healed in three weeks.

S. C., aged fifty-nine; general debility. Leg ulcer four inches by two, irritable, and spreading. Admitted August 8th. Had ulcer six weeks. Healed in six weeks.

J. T., aged seventy-three; decay. Had ulcer, more or less, twenty years; this time open two years. A large ulcer, eight inches by six, covering front of leg. Healed in six weeks, all but a square inch, which will soon be also well.

J. G., aged fifty-three; a degenerate drunkard. Leg ulcer eight years; this time open eight months. Healed in five weeks.

R. L., aged thirty-eight. A generally perforated condition of skin and leg; debility and syphilis five years; open this time six months. Healed in six weeks; paste locally, iodide of potassium internally.

J. K., aged eighty; senile decay. Large ulcer of leg two years. Half healed in six weeks. (I am not inclined to heal further on account of his age.)

W. B., aged thirty-seven. Ulcer of leg two years; circumference nine inches. Rapidly healing in four weeks.

W. B., aged thirty-eight. Severe ulcer on leg two years; unhealthy skin. Ulcer healing rapidly in six weeks.

M. H., aged sixty-three. Very large ulcer; leg much swollen; three years. An inch of cicatrix all round in a week.

J. W., aged fifty-eight. Ulcer of leg three years. Rapidly healing in a fortnight.

R. B., aged eighty-five. Very large deeply excavated ulcer; open eight years. Transplantation tried and failed. In a month granulations gained surface, and ulcer filled up; the skin process is beginning.

W. W., aged thirty-one. Leg ulcer three years. Half the ulcer healed in a fortnight.

W. G., aged thirty-five. Leg ulcer ten years. Transplantation failed. Gradually healing, but slowly, under the paste treatment.

S. W., aged sixty-six. Leg ulcer ten years. Much better since paste applied for three weeks. Healing slowly.

E. —, aged fifty-four. Leg ulcer five years. Partly healed by lotions; now healing much more rapidly under paste.

J. H., aged thirty-four. Large leg ulcer, three years; partially healed under a lotion consisting of dilute nitric acid and opium; then came to a standstill; now healing under paste.

There have been two cases of general ulceration from want of food, and several cases of syphilis, which it was not thought advisable to treat with the paste.

There are certain unusual conditions which arise under this treatment which are worthy of notice:—

1st. Islands of skin or cicatricial tissue arise in some cases in the centre of the ulcer, as well as from the circumference.

2nd. There is for some days after applying the paste a large increase in the ulcer secretion; this afterwards becomes normal.

3rd. The remedy is a painless one.

4th. The cicatrix has a peculiarly healthy, strong appearance.

That it is not the rest in bed, nor the pure air of this locality, nor the regular diet and cleanliness, alone, because, useful as all these are, we have not found unusual results with other symptoms of treatment. The cases we get in workhouse practice are, as a rule, so unfavourable in persons whose bodies are degenerate in every sense, that any plan of treatment which succeeds with them must still more succeed in the healthy individuals in private practice. As to the propriety of healing up old ulcers in aged people, we take each case on its merits, often stopping short of completely closing them up.—*Lancet, Nov.* 16, 1872, *p.* 705.

66.—ABORTIVE TREATMENT OF FURUNCULI.

As soon as on any part of the body there is perceived that characteristic redness, round in form and variable in size, with a culminating point in the centre, which, red at first, soon turns to a greyish white, pour into a little saucer a thimbleful of camphorated alcohol; dip three fingers of the right hand into the liquid, and gently rub the suspected part, especially the middle; moisten the fingers, and rub again in the same manner eight or ten times, for half a minute each time. After this friction, dry the place well, and cover it lightly by the finger with camphorated olive oil, to prevent the evaporation of the strength of the alcohol applied. It is rare for a blind boil or furuncle, at the moment of lessening, to resist four applications of this kind. Often they have been seen to decrease in inflammation, to dry up and disappear, after only one application. When many applications are necessary, it is well to let a certain interval of time elapse between them—for example, to make them morning, midday, and evening. They never fail to take effect.—*L'Abeille Médicale, and British Medical Journal, Dec.* 21, 1872, *p.* 687.

67.—FENESTRATED NON-ADHESIVE PLASTER FOR SKIN-GRAFTING.

By Dr. John W. Bligh, of Montreal, late House-Surgeon, Kidderminster Infirmary.

Having frequently experienced the want of a more suitable form of plaster than that in ordinary use for the dressing of ulcerated wounds upon whose surface pieces of healthy skin had been grafted, I was induced, after many experiments, to adopt the following simple but efficacious method of producing a plaster with the requirements I considered necessary.

An oblong or oval opening is cut in the centre of a strip of adhesive plaster, which should be of the requisite breadth and of length sufficient to reach one or two inches beyond the opposite sides of the wound for whose dressing it is intended. This opening or fenestrum is easily made by folding the strip in half lengthways, and removing a piece from the folded extremity with a pair of scissors. Upon this strip, so fenestrated, a thin strip of gutta-percha tissue of the same breadth, but somewhat shorter, is then laid over its adhesive surface, and made to adhere by means of a little gentle pressure with the warm hand.

In placing this on, care should be taken to make it lie evenly, and to extend equally on either side of the fenestrum. Being thus prepared, it is placed over the wound in such a position that the skin-graft will be directly beneath the fenestrum, and seen through it as through a window-pane.

It will be found to possess the following advantages:—

1. The gutta-percha tissue will render the surface of the plaster covered by it perfectly non-adhesive, whilst those portions uncovered at the extremities will readily adhere to the healthy skin.

2. The fenestrum over which the tissue is seen stretched will be found transparent, so that the growth and development of the graft beneath may be viewed from time to time. Although, for all practical purposes, the gutta-percha tissue in ordinary use for surgical dressing will be found a sufficiently transparent medium, still where a more perfect one is required, as for clinical instruction, a thin layer of mica or talc may be substituted. This is a more expensive material, and of no superior advantage for general use.

3. It will be found stouter, and to retain the graft in situ better than the various transparent plasters now used. In addition to this, it is not so liable to draw into a twisted string as the latter almost invariably do.

In conclusion, I may say that if a non-absorbent adhesive plaster could be obtained for the purpose, it would be greatly advantageous, as then it might be allowed to remain on the wound for days without becoming foul. I have not in practice seen such a plaster used, but think it might be easily made by applying the adhesive material over a waterproof fabric instead of on the ordinary calico. Not only in this, but in other departments of surgery would a non-absorbent adhesive plaster be found useful.—*Lancet, March* 8, 1873, *p.* 360.

68.—THE TREATMENT OF BOILS BY ALCOHOL.

M. **Nelaton** has for more than twenty years prescribed the use of alcohol for the prevention of these smaller abscesses which are so common amongst young people, and which so seriously impair the beauty of the face. It appears that this treatment is now extending, as some interesting details are to be found in a communication of M. Simon de Forges, of Sainte-Fourtaine, which appeared in the Revue deThérapeutique. In speaking of boils, small outward abscesses, and other inflammations of the epidermis and of the derma, he observes that as soon as the characteristic circular redness appears on any part of the body, whatever may be its size, with a point rising in the middle, making it a greyish white, a thimbleful of camphorated alcohol should be poured into a saucer; the palm of the hand should be wetted with it, and this should be rubbed with gentle friction over the affected place. The fingers should be again steeped, and the friction continued as often as eight or ten times every half minute. The place should be well dried, and before covering it up, a little camphorated olive oil should be applied to prevent the evaporation of the fluid.—*Journal de Médecine, and Practitioner, Dec.* 1872, *p.* 378.

SYPHILITIC AFFECTIONS.

69.—ON THE COMMUNICATION OF SYPHILIS IN THE PRACTICE OF VACCINATION.

By **Jonathan Hutchinson**, Esq., Senior Surgeon to the London Hospital.

[The following paper by Mr. Hutchinson was read before the Royal Medical and Chirurgical Society.]

This paper contains an account of two series of vaccination-syphilis (each series containing but a single case) which have come under Mr. Hutchinson's notice since his last communication on the subject in 1871. These two cases (forming the author's third and fourth series) are prefaced by a few remarks referring to cases published by others on the continent and at home; the author also re-asserts the great importance of making all such cases public. The latter part of the paper is occupied with general conclusions and recommendations drawn from a consideration of all the cases which have come under Mr. Hutchinson's notice.

Third Series.—Case.—This patient was a respectable small tradesman, forty-six years old, who came under Mr. Hutchinson's care at Moorfields Ophthalmic Hospital with double iritis. Examination disclosed the presence of a copious dusky rash and symmetrical ulcers in the tonsils. The ordinary questions as to syphilis were denied, and careful inspection of the genitals gave an entirely negative result. On one arm, however, two or three scabbed ulcers were found, as large as shillings, with dusky indurated borders; and there was an indolent bubo in the corresponding armpit. He said that the sores on the arm had broken out at the seat of the vaccination-punctures. He had been vaccinated three months before admission; the punctures took, and behaved as usual; but when just healed over, a month after the operation, they inflamed and broke out into sores. About a fortnight later (six weeks after vaccination) the rash appeared, and at the end of another month the iritis set in. The nature of the disease had not hitherto been diagnosed, and no specific treatment had been used; under the use of mercury both iritis and rash were cured. This man was seen by many medical men at the hospital during the two or three months of his attendance, and there could be no shadow of doubt about the nature of his malady. Although his vaccinator had not diagnosed this man's case, he had had much trouble with the arm-sores which from his subsequent account would appear to have been at one time almost phagedenic. Besides the patient, about twelve others were vaccinated from the same baby, three of them being the patient's children, young adults; in these three no ill results have occurred; the remaining cases have not been pursued further (for prudential reasons detailed in the paper), but the vaccinator believes that none of them had any trouble, save one or two in whom a little difficulty occurred in the healing of the vaccination spots. The vaccinator said that the baby used appeared in excellent health at the time. When seen by Mr. Hutchinson at eight months old it was fat and well grown, the only sign of inherited syphilis being the markedly sunken bridge of the nose—a symptom to which the author attaches considerable importance, and from which he predicts with some confidence the future occurrence of confirmatory events. The child was the third, and the only living one, the first two having died in infancy. In favour of this man's syphilis having been gained during vaccination we have the occurrence of induration, &c., in the vaccination-scars at exactly the interval which is known from former cases to elapse between inoculation with syphilitic virus and formation of the chancre, the occurrence of axillary indolent bubo, the eruption and other secondary symptoms following the arm-sores at the proper period, and, lastly, the total absence of any trace of chancre elsewhere and the extreme improbability of syphilitic inoculation of the vaccine sores after the vaccination. Against this conclusion there are only the negative facts afforded by the apparent immunity (which may, however, yet be disproved) of the other persons vaccinated, and the slight evidence of syphilis in the vaccinifer; the latter being what is to be expected, since no one would think of vaccinating from an obviously syphilitic child.

Fourth Series.—Case.—A lady about forty-five; who came to Mr. Hutchinson as a private patient in December 1872, for a vascular growth from the urethra. During examination the remains of a copious, dusky, evidently syphilitic rash were found. On inquiry, she stated that she had been very ill after vaccination, and had had a severe rash and inflammation of one eye. Further examination showed the presence of a dusky scar at the seat of one of the vaccination-punctures, very different indeed from a normal vaccine cicatrix; synechiæ were also found in the left eye, proving past iritis. She was vaccinated in May, 1871, by four punctures, none of which took; just a month later one of them inflamed, and became a hard-edged ulcer, lasting three months. Two or three weeks later (about two months after vaccination) the rash appeared copiously, and she fell into ill health. From the vaccination in May to the early part of September, she had no specific treatment, which probably accounts for the severity of the rash, &c. After this she took small doses of iodide of potassium and bichloride of mercury, under another practitioner, for nine months, when she ceased all treatment, and went for two months to the seaside. At the end of this period her left eye inflamed (iritis), and the rash, which had been nearly well, relapsed. For the iritis she was treated at Moorfields Hospital by a colleague of Mr. Hutchinson, its cause and origin being suspected, but not followed out. It was several months after her admission to the hospital that she came under the author's care for a complaint having no connexion with the syphilis. She was vaccinated from a baby's arm, and at the same time her two grown-up daughters. A number of others had previously been vaccinated from the same child, but these have not been traced. The two daughters, however, appear to have escaped all contamination. The baby is said by the vaccinator and its own mother to have looked quite well at the time. As soon as dentition began, however, it had some very troublesome sores about the anus (? condylomata), for which it was under treatment three months at a dyspensary. It is the third child. All are living. The eldest, a boy about six or seven years old, shows no signs of inherited taint; the second, a girl of five, now has a large forehead, and she had exactly the same sores about the anus and at the same age as the vaccinifer; the vaccinifer itself also now has a large forehead. The author calls attention to the fact that these two cases of vaccination-syphilis were not, as were the first and second series, sent to him because he was known to be interested in the subject, both of them having occurred in the ordinary course of practice. Several cases of supposed syphilis from this cause have been sent to him, but the diagnosis in these was not confirmed.

Conclusions and general remarks based on the four series of cases.—These are summed up chiefly as answers to certain questions. The author first asks: What are we to infer from the circumstance that when syphilis is conveyed in the practice of vaccination it does not affect all those vaccinated from the tainted source? And he answers: We must believe that the specific poison of syphilis is either not contained in the vaccine lymph at all, or is not equally diffused through it. Thus, in the first series of cases, two out of twelve vaccinated escaped syphilis; in the second series, out of about twenty-six vaccinated more than half escaped; while in the third and fourth series only one out of at least twelve vaccinated from each vaccinifer is known to have been syphilised. It will be borne in mind, however, that the last two series have purposely not been followed up exhaustively, and that the proportion tainted with syphilis is not improbably greater than appears at present. Again, from the evidence of these series of cases there is no doubt that we may vaccinate from a tainted vaccinifer without conveying syphilis; and, on the other hand, it is possible to convey syphilis either with or without the production of a normal vaccine vesicle. Vaccination from a child evidently syphilitic is known to have been done inadvertently several times without bad result, and probably it has often occurred without being known. These points of clinical evidence make it highly probable that the syphilitic virus is not contained in the vaccine virus, but is derived from, or associated with some cell-elements of the blood, and probably these need not be visibly red. This is confirmed by experimental evidence, for syphilis has been successfully produced by inoculating the blood of a patient in the secondary stage, and in the case referred to, the dates, &c., agree closely with those observed in the author's series. Next, need blood be used in vaccination in order to convey syphilis? The author thinks that probably it is enough if the material used has been mixed with colourless exudation from the blood as occurs when the vaccine vesicle is allowed to drain in order to furnish more lymph. This is confirmed by the fact that the vaccinators in the cases in question asserted that they always scrupulously avoided making the vesicle bleed; in none of the instances is there any history that the lymph was visibly bloody; while it is well known that many men of large experience do allow the vaccine vesicle to weep. According to this supposition, as soon as the first contents of the vesicle are exhausted the risk begins. Third: If the syphilitic virus and the vaccine virus be implanted at one and the same time, what will be the course of events? If the patient is susceptible of vaccination the vesicle goes through its usual phases and heals, and nothing more happens till the end of a month, when the scar indurates and the chancre forms. In some cases, however, the vaccination sore never heals, and in these the scab somewhat obscures the characters of the chancre.

Characters of the vaccination-chancre.—It begins as a little, red, firm, glossy, tubercle, which gradually increases in size, and becomes harder. In about a fortnight it usually ulcerates, the sore giving off but very little discharge, and with a hard base and edges. If no mercury is given it may remain open several months; in one case it probably became almost phagedenic. Sometimes there is from the first a good deal of inflammatory effusion at the base of the sore, and much purulent secretion and scab on its surface; its specific characters may be thus quite hidden. These cases are generally in children.

Treatment of the vaccination-chancre.—Mr. Hutchinson feels no doubt that should a vaccination-scar take on the induration characteristic of a chancre, and should the other facts of the case corroborate the suspicion, it is the surgeon's duty without delay to commence the administration of mercury. The influence of mercury in retarding and greatly diminishing the severity of the primary and secondary symptoms was most marked in all those cases which came under care at an early period (sixth week), as in the first series. Indeed, in this series the eruption was so retarded as to induce scepticism in not a few minds as to the correctness of the diagnosis; several of them, however, from five to seven months after vaccination had undoubted, though mild, secondary symptoms. In the second and remaining series of cases, however, the disease was not discovered until much later, and most of them suffered very severely from secondary symptoms, the last two cases (third and fourth series) particularly so. As regards tertiary symptoms, it is yet too early to say anything. Concerning the primary and secondary symptoms, Mr. Hutchinson says: "I cannot speak too strongly as to the vast apparent advantage of the mercurial plan. The lesson of the cases is very clearly opposed to the too prevalent modern doctrine that it is well to wait for secondary symptoms before commencing specific treatment, and would appear to indicate that the latter should be adopted as soon as ever the condition of the chancre permits of an accurate diagnosis."

As regards *prevention*, Mr. Hutchinson thinks it of the first importance to diffuse the knowledge that vaccination-syphilis is possible widely amongst the profession; until all medical men believe in it, and fear it, we shall still be very unsafe. It is important next to avoid vaccinating from children whose parents are not known to the vaccinator; and, further, to decline, for the most part, using all first-born children, waiting until, by the development of one healthy child, a guarantee of freedom from taint on the part of the parents has been given. Lastly, the avoidance of blood-stained lymph and of recent exudation from the walls of the vesicle is a sufficiently obvious precaution, and needs no further mention.

Dr. George Harley said that the importance of the paper could not be denied, and that the facts had been ably and interestingly brought forward. The former paper had excited in the profession, and in those outside of it, great disquietude. There was a party who seemed to hold out against vaccination, and the first paper seemed to strengthen them. He thought that the thing ought to be put clearly either for the danger or the innocuity of vaccination. The question was difficult to solve whether there was any danger of syphilis through vaccination; it was often suspected, but there was nothing positive. Mr. Hutchinson appeared to have done this. There was one point of great importance: how long does the poison remain in the system? (How soon and how easily it may enter the system we all know.) Mr. Hutchinson had referred to cases where blood had been inoculated; he remembered seeing in the hospital at Munich, about twelve years ago, an old woman, aged seventy, on whose back between the shoulders there was a large chancre, which had been produced by the following experiment: some blood had been taken from a patient on whom the secondary symptoms were just disappearing, and injected under the skin of the old woman. So that syphilis can be conveyed by the blood. Then what interval should be allowed to intervene before it was considered safe to vaccinate from a child who had secondary symptoms? A gentleman some years ago consulted him for some chest affection; there was a slight protuberance on the prepuce; he laughed at the idea of syphilis, as it was eighty days since he had been exposed; fourteen days afterwards the spot became tender, softened, and sore, and this was ninety-three days after inoculation. Mr. H. Lee saw the patient with him, and the piece of the prepuce was excised; under the microscope the fibroid elements usual in a chancrous formation were seen; the patient had no eruption, but the wound was a long time healing, seven or nine months, and then under the influence of mercury. He had married, and had several children, but had never had secondary symptoms. This would prove that ninety-three days may pass before symptoms appear. He agreed with Mr. Hutchinson in not thinking that syphilis could be conveyed by pure lymph, but thought it would if blood or pus, or mucous corpuscles from the walls of a vesicle, were inoculated. Security could only be obtained by using the first drops taken from the vesicle; in this way there would be no danger to the profession or to the public.

Mr. **De Meric** said there was no doubt as to the conveyance of syphilis by vaccination. He thought the evidence brought forward to-day was not so strong as in the previous cases. He thought the condition of the vaccine should be considered; so many escaped, and only one or two of each series fell victims; it would be well to inquire if the victims had not had it before. He was not quite satisfied with the two cases; he thought in the first it might be explained otherwise; the man might have been syphilitic when vaccinated; the symptoms described were not doubtful. The second case seemed to him weak; the two daughters escaped, and only the mother was affected. Mr. Hutchinson had spoken of the means to be employed to avoid the danger, and these all must admit. Vaccination must always have been carefully performed here, as mishaps have been known in Italy and Germany, and not here except in Mr. Smith's case. The advice given to vaccinators was excellent, but he did not think it was efficient. A reformation was needed. The period for vaccination ought to be extended to the sixth month, and then there would be time for the symptoms to appear; for an infected child may appear quite healthy at the third month. There was another thing, vaccination from the heifer should be employed at times. The ex-royal family of Naples were thus vaccinated, and why should not others have the same advantage? He thought this mode should be encouraged, but here it was withheld. He had seen it used in Paris, but perceived that private enterprise would not make it succeed here; it would require the advocacy of the Privy Council. He saw Dr. Seaton, who discouraged the mode, saying that there was no vaccination-syphilis here, and so it was not necessary. In some countries, as Italy, the people had a choice.

Mr. **Henry Lee** said that the cases appeared complete, but the same idea had struck him as Mr. De Méric—it was not shown that the patients had not had syphilis; for if once a person had had syphilis, vaccination relit it up. The worst case of secondary syphilis he had seen was in a gentleman after vaccination; symptoms had been set up lasting for years. Then why do some take it and not others? This he thought might be explained by the fact that syphilis was not a persistent disease; it had its time of development; it subsided and recurred; the poison took in one and not in another. If blood was taken then it produced syphilis; so if lymph taken from a person likely to have an outburst were used, syphilis would follow.

Mr. **George Cooper** said he had been a public vaccinator for twenty-seven years, and had vaccinated many thousands, but he had never seen a case of syphilis after vaccination. He did not deny that it might occur, but he had never seen it. He believed that if the vesicle were not wounded, and only pure lymph used, no syphilis could occur.

Mr. **Hutchinson**, in reply, said that, as to the duration of syphilis in an individual, and how long we should wait to avoid danger from vaccinating from an infected person, all would agree that if a person has once had syphilis it would always be dangerous to vaccinate from him. With regard to his cases and their value, in the first the man had a chancre and nothing else formed. As to the vaccinifer in the second case, that child and an older one suffered from ulceration of the anus when teething; the surgeon who attended the child said he had no doubt it was a condylomatous growth; so the vaccinifer was syphilitic. Then the duration of the syphilis in the family was interesting. This child was born six years after marriage, and three years after the second. These were somewhat alarming facts as to the latency of the syphilitic virus. When the surgeon vaccinated the child he could not have supposed it was syphilitic; there were no symptoms then, and, if questioned, the mother could have shown her eldest child healthy. This mother had a baby at the breast, and she had promised to bring it to him that he might see if it showed signs of congenital syphilis. The laws of latent syphilis needed to be investigated. Some say that children never have it long latent—never show it after the fourth month. Mr. De Méric's proposition was good as to the age of a child when vaccinated, but he believed the blood could convey the taint, and yet no symptom be found in the vaccinifer, and the child might pass through infancy and only show it at puberty, as by iritis, etc. He (Mr. Hutchinson) did not see any weak point in the second case. In the first case vaccination-syphilis was not so clearly proved. Two children had died; but he could get no symptoms of syphilis, and had only the physiognomy of the vaccinifer to prove it at present. He had not spoken of vaccination from the heifer, as he did not think it came into his paper. He did not think compulsory vaccination could be maintained unless we allowed children to be vaccinated from other sources. As to the risk run in his second case, the lady wanted to be vaccinated from a heifer. The surgeon at last said this child was healthy, and used it, and syphilis followed; so there was difficulty in saying the child was quite free. There were no facts to prove that the persons were the subjects of syphilis before vaccination. Vaccination might affect a previously diseased constitution, but could never bring out in a person previously healthy symptoms of primary and secondary syphilis. Then there was the question, what degree of alarm was to be felt by the facts established? Was the occurrence of syphilis in this way a rare thing? He should say that if the gentleman in whose practice the second series of cases occurred had been asked that question he would, before he had sought out the cases, have said the same as Mr. Cooper had said. It was the same in the two series he had now brought before the Society. He had doubtless met with cases before this, as had other practitioners, but had never thought of them till his attion was called to them by others.—*Lancet*, *Feb.* 1, 1873, *p.* 169.

70.—ON VACCINATION-SYPHILIS.

By the Editor of the Lancet.

[Our own opinion of the cases given by Mr. Hutchinson, and referred to in the preceding article, would not be weighty, but the following remarks by the Editor of the Lancet are important.]

The proceedings at last Tuesday's meeting of the Medical and Chirurgical Society possess a great but melancholy interest. They mark, we fear we must say, a new and very considerable advance towards the proof that syphilis may be inoculated during the process of vaccination. Notwithstanding all the assertions which had been so freely made at various times that syphilis could be thus communicated, there had never been any sound evidence of the fact until Mr. J. Hutchinson, in 1871, related the history of two series of cases, in each of which primary and secondary symptoms had been communicated to several persons by one vaccinifer. We do not now care to go over the old French and Italian evidence respecting asserted outbreaks of vaccino-syphilis, for we have frequently intimated our opinion that the facts in all these cases had been put together with such carelessness and such an utter absence of patient sifting as must impress any unbiassed mind with the danger involved in basing upon them any conclusions respecting so serious a question as that of vaccino-syphilis. It was otherwise with Mr. Hutchinson's two series of cases brought forward in 1871. Even on that occasion the Lancet felt itself called upon to fulfil the function of *advocatus diaboli*, and to urge every possible objection and difficulty with which the supposed facts could be met, more especially until the persons supposed to be affected with chancre had corroborated this belief by developing secondary symptoms. But we did not hesitate from the first to admit that Mr. Hutchinson's mode of conducting his inquiries was far more reliable than anything of the kind that had been previously seen; and we may at once make the same admission respecting the histories which he related on Tuesday last.

As the paper and the discussion will be found in another part of our columns, it will only be needful here to point out the principal circumstances of interest in the two new series of cases.

The first (or, taking in Mr. Hutchinson's previous paper, the third) series of facts starts from the case of a well-conducted married man, aged forty-six, who applied at the Moorfields Ophthalmic Hospital on account of iritis, which was at once detected to be syphilitic, as it was accompanied with secondary rash, &c. He had been vaccinated three months previously; but his sore, after healing, broke out again about a month after vaccination, and took on the form of hard chancre (with indolent bubo in axilla). A fortnight later a copious secondary rash appeared; the iritis occurred a month after this. The vaccinifer was a baby who, when seen by Mr. Hutchinson (at eight months old), looked healthy, and showed no signs of syphilis except a sunken bridge of the nose; it was a third child, the first two having died in infancy. It is remarkable that, of twelve persons vaccinated from the same baby, only the man above mentioned suffered any harm; it is believed that he was the last of the twelve, and so got, not pure lymph, but either blood or serum newly exuded from the vessels.

The second (or fourth) series was brought to light through the case of a lady, aged forty-five, who applied to Mr. Hutchinson on account of a vascular growth in the urethra, but was discovered to be suffering from syphilitic rash. On inquiry, it appeared that she was vaccinated in May, 1871, that none of the punctures took, but a month later one of them inflamed and formed a chancre, which was followed by rash and iritis. The lady was one of three persons (the two others being her daughters) who were vaccinated at the same time from the same baby. The daughters suffered no harm. A number of other persons had been previously vaccinated from this child, but they could not be traced. Here, again, it is probable that the lady who got syphilised was the last of a considerable series vaccinated, and must have been inoculated with freshly-exuded serum, not the original lymph of the vesicle. The vaccinifer was looking well at the time of the vaccination, but afterwards, during its dentition, got condylomata; and an elder sister had condylomata and slight hydrocephalus.

We think, then, that the inference from the whole group of cases related by Mr. Hutchinson must be decidedly in favour of the *possibility* of communication of syphilis by the inoculation either of the blood of a syphilitic vaccinifer, or of the serum which oozes into the vesicles if the vaccinator be unwise enough to continue to take fluid after the first drop of lymph—the true product of the vaccination—has been exhausted. Not one particle of evidence has been adduced to show that the true lymph can be infected with syphilis; and, as our readers are doubtless aware, the evidence against such a possibility is enormously strong. And even the communication by blood, or by serum obtained after the first emptying of the vaccine vesicle, though it must now be admitted as a possibility, cannot for a moment be regarded as more than a very occasional result of these accidents. We are very glad to observe that Mr. Henry Lee had the sense and candour to point this out forcibly on Tuesday. He observed that, supposing constitutional syphilis to be communicable by blood or serum, it was plain that this was no necessary process, but only happened when the constitution of the person from whom the inoculation was received chanced to be in some peculiar state of ferment which revived the dormant activity of the syphilitic poison. This must certainly be true, or syphilis would be far more widely diffused in the world than it actually is. By these arguments it is evident that we reduce to a minimum the chances of vaccinal communication of syphilis; for the latter event can only take place when all the following conditions are simultaneously present:—(1) A syphilitic vaccinifer; (2) an active condition of the syphilitic element of the vaccinifer's blood; but, at the same time (3), an absence of such external symptoms of syphilis as would deter any commonly upright surgeon from using the subject of them as a vaccinifer; (4) the gross imprudence committed, of employing either blood or the serum obtained after the emptying of the vesicle. It is an absolute impossibility that all these conditions can be more than very rarely fulfilled, and we therefore think that Mr. Hutchinson is gravely to blame for the tone of his remarks in his concluding speech at the meeting. Those remarks, when translated by the imperfect understanding of the non-medical public, will convey a most erroneous impression as to the prevalence of vaccino-syphilis, and will aggravate in a perfectly unwarranted manner the terrors of the laity. And as for the practical suggestion made by Mr. Hutchinson and another speaker, that the date after birth within which vaccination is compulsory should be altered from three months to six months (or, indeed, as Mr. Hutchinson suggested, to some indefinitely older age), in order that the freedom of the vaccinifers from syphilitic taint may be placed beyond suspicion, we must express our condemnation of any such proposal. To those who know anything of the enormous practical difficulties in so handling vaccination as to make it a really efficient prophylaxis against outbreaks of small-pox, we need hardly say that even the extension of time to six months would render compulsory vaccination almost entirely inefficient as a real preventive, and any further extension of the period would convert the whole affair of vaccination into a mockery, and turn our hopes of stamping out small-pox to vanity and delusion. It is a perfectly intolerable risk which we are asked to incur, and we trust that Mr. Simon will lose no time in denouncing a proposition which is fraught with national danger of the gravest kind, and which is utterly unjustified by the very small number of facts which so keen a clinical investigator as Mr. Hutchinson, with an enormous field of observation at his command, has been able to detect. —*Lancet*, *Feb.* 1, 1873, *p.* 175.

71.—VACCINO-SYPHILIS.

By George G. Gascoyen, Esq., Surgeon to the Lock Hospital, and Assistant-Surgeon at St. Mary's Hospital.

[The writer is unable to adopt the conclusion arrived at by Mr. Hutchinson, that the fourth series is an undoubted instance of vaccino-syphilis. He is disposed to regard it as a case of vaccination in a person already syphilitic, rather than one of syphilis conveyed by vaccination.]

These cases are of such extreme importance, and are liable to so many sources of error, that they ought not to be recorded as authentic so long as a reasonable doubt exists as to their true interpretation; and to arrive at this, it is, above all things, necessary that the patient should have been watched by a competent observer, especially at the commencement of the disease before the local symptoms have disappeared, so that the chain of evidence may be continuous from the beginning, and guaranteed by a responsible person; but in the case before us this does not appear to have been done, and it seems to me that there are many serious flaws and gaps in the links, to some of which I beg to direct attention.

The patient was vaccinated in May, 1871, and did not come under Mr. Hutchinson's care until December, 1872, so that more than a year and a half had elapsed between the suspected vaccination and her first examination by him. All, therefore, that Mr. Hutchinson is able to aver of his own personal knowledge is, that the woman had a dusky mark on her arm, and was suffering from syphilis at the time he examined her.

The early history of the case—accuracy in which is absolutely essential in such an inquiry—appears to have been derived from the patient herself; and, as it was obtained so many months after the occurrence of the symptoms, can only be judged *quantum valeat* by each of your readers; it certainly fails to convince. And even if given by an ordinary medical witness so long afterwards, such evidence would, in my opinion, be insufficient to lead to a satisfactory conclusion.

To corroborate the statement that after the vaccination the woman had "a hard-edged ulcer, lasting three months," the report mentions that there was "a dusky scar at the seat of one of the vaccination punctures, very different indeed from a normal vaccine cicatrix"; but this fact proves little. My own limited experience is that revaccination, even when followed by good vesicles, rarely leaves typical marks in healthy adults; and that it sometimes does leave dusky or discoloured scars in them, when the punctures have been followed by inflammation and ulceration; here, though, I am open to correction by others better qualified to give an opinion on this matter. But that these troublesome sequelæ to revaccination are not infrequent in syphilitic persons I can confidently affirm, having seen several instances where it was attended by violent inflammation, with severe and persistent ulceration, which, on healing, left a superficial discoloured scar lasting many months.

I can also fully endorse Mr. Henry Lee's opinion, that revaccination will sometimes light up the dormant disease in a person already the subject of syphilis; and, without a previous knowledge of the patient, this may readily lead to a suspicion that impure lymph has been used.

A knowledge of these facts gives us, I think, a much more probable explanation of the symptoms which followed vaccination in this patient than by referring them to the very unusual occurrence of syphilitic contamination by vaccination; and, until further confirmatory data are obtained, we are warranted in withholding our assent from this uncommon accident as the cause of her disease.

In his reply to the remarks made at the meeting, Mr. Hutchinson is reported to have said:—"There were no facts to prove that the persons were the subjects of syphilis before vaccination." On the other hand, there were none to prove they were not; and, with all deference to his opinion, I think in the case now under consideration there *is* a strong point of evidence to show that the patient was, most probably, already syphilitic at the time of her revaccination. For she was vaccinated with her two grown-up daughters, from the arm of a baby which had previously been used to vaccinate a number of other persons. The contents of the vesicle, therefore, must have been exhausted before the patient and her daughters were vaccinated from it; consequently the same material—*i.e.*, the oozing or the draining of the vesicle—would be used for all three of them; but although the mother afterwards had a bad arm, and suffered from an attack of syphilis, the two daughters, equally prone to contract the disease, escaped.

This circumstance contributes, moreover, a strong argument that the vaccinifer was not tainted; and, indeed, from the report, it is by no means clear that the family, or this child, were syphilitic. The vaccinifer was the third of these children, all living. The first had never shown any suspicious symptoms; the two youngest, whilst teething, had been treated for sores about the anus, and both are said to have large foreheads. Although we may justly regard such symptoms with distrust, yet soreness about the anus during dentition is by no means pathognomonic of syphilis, unless the ulceration be distinctly condylomatous (mucous tubercles), which Mr. Hutchinson cannot positively assert, as he did not see the child until long after this had disappeared; neither is a slight enlargement of the forehead necessarily of syphilitic origin, for this also may be produced by other causes. The grounds, then, for believing that the vaccinifer was syphilitic are extremely slight, and far more than counterbalanced by the rebutting evidence above mentioned.—*Lancet, Feb.* 8, 1873, *p.* 219.

MIDWIFERY,

AND THE DISEASES OF WOMEN AND CHILDREN.

72.—ON THE TREATMENT OF SOME UTERINE DISEASES.

By Dr. Lombe Atthill, Obstetric Physician to the Adelaide Hospital, Dublin.

There are three methods of making applications to the interior of the uterus; one is the injecting of fluids into its cavity; another the introduction of a piece of solid caustic into the uterus, by means of Simpson's intra-uterine *porte caustique;* the third is the passing up to the fundus, a stilette armed with a layer of cotton or strip of lint saturated with nitric acid, with the acid nitrate of mercury, or some other active agent.

The first of these methods I have never tried, as it is a practice not free from danger, and not only so, but also much less certain and satisfactory in its results than either of the others.

The second I have frequently practised, in cases of imperfect involution of the uterus; where no inflammation exists its effects are most excellent, but it does not, so far as my experience goes, produce, by any means, so satisfactory results in the treatment of endo-metritis, as does nitric acid if properly applied.

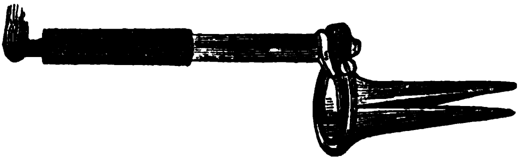
The application of strong caustics to the interior of the uterus, of which, in my opinion, the fuming nitric acid is by far the best, is a practice now extensively carried out, not only in this city, but also in America. Our brethren, however, in England and Scotland seem as yet unacquainted with the advantages which follow this treatment. I am quite ignorant as to whom we are indebted for introducing into practice this method of treating chronic endo-metritis. Dr. Miller, of Louisville, U.S.A., in an excellent article published in the number of the American Journal of Obstetrics for August, 1871, claims to have been the first to advocate the application of remedies of this class to the interior of the uterus; his lectures, of which, however, I have not been able to obtain a copy, were published in 1855. Dr. Thomas, of New York, informs us that Dr. Marion Sims introduced the practice of thus employing fluid caustics in the treatment of intra-uterine disease into the woman's hospital in that city with great advantage, and as Dr. Sims left America in the year 1862, he must have carried out the practice some time prior to that date.

There can be no doubt, however, but that the first person who ventured to apply the strong nitric acid to the cavity of the uterus in this country was Dr. Kidd. Dr. Marion Sims's method of applying fluid caustic to the interior of the uterus, as described by Dr. Thomas, is, "To wrap a thin film of cotton round a probe, and, having dipped it into the fluid selected, to pass it up to the fundus of the uterus, and to keep it there for about half a minute." This, in the main, is identical with the plan advocated by Dr. Miller. This treatment is simple, safe, and painless, but, if carried out on the above method, the cauterization thus effected is not in general sufficient; the cervix and os internum are doubtless in all these cases relaxed and patulous, but not sufficiently so to prevent their pressing out much of the caustic with which the *film* of cotton is saturated, and if the uterus be, as is not unfrequently the case, retroflected or anteflected, it is hardly possible that any caustic will remain on the cotton when the probe has reached the fundus. It is therefore most desirable first to dilate the cervix still further by the introduction of one or two pieces of sea-tangle or sponge tent, and, when the application is about to be made, to seize the anterior lip of the uterus with a vulsellum, so as to bring it low and at the same time to steady and straighten the organ; you can now pass a stilette armed with a comparatively thick layer of cotton or roll of lint rapidly up to the fundus; indeed, if the case be severe or of long standing, this should be done twice, so as to insure the thorough cauterization of the whole inner surface of the uterus. I have practised this method frequently with great success, and in no one instance have seen any unpleasant results, though, at the same time, I freely admit that a cure does not invariably follow.

I have been thus minute in describing the method of carrying out this practice because some practitioners have still a great dread of applying powerful caustics to the interior of the uterus—a fear which is totally groundless. Applying strong nitric acid, in the manner described, to the cavity of the uterus, seldom causes any pain whatever. And in this respect its application differs entirely from that following the injection of even weak solutions of caustic into the uterus; grave symptoms, and even death, having followed that practice. Therefore, while I advocate the use of nitric acid and of the solid nitrate of silver as safe applications to the interior of the uterus, I strongly object to intra-uterine injection of any fluid in the treatment of the class of cases under consideration.

There is just one precaution needed in carrying out this practice, and that is to guard the cervix uteri, in cases where the cervical canal is healthy, from the action of the nitric acid, for if this precaution be neglected, contraction of that canal is likely to occur.

But the mode of applying nitric acid which I have described, and which is that adopted by others in this city, and until recently by myself, is liable to this objection, that it cauterized most freely the lower segment of the cervix, the part which in general requires it least, and which in many cases it is desirable should escape entirely. I have, therefore, devised this little instrument, which I may term an *intra-uterine speculum;* it is, in fact, something like an aural speculum, only that it is expanded by means of a screw which works through a long handle. I have tried it, and it answers the purpose in view very well; namely, the protecting the cervical canal from the action of the acid, and the ensuring the thorough cauterization of the cavity of the uterus. It is only intended to be used after the cervix has been dilated, and not as a dilating agent. When it is employed, the duck-bill speculum may be withdrawn, as both the cervix and vagina are protected from the action of the acid; but it is not advisable to release the exterior lip of the uterus from the grasp of the vulsellum, as, were this done, the speculum might slip out of the cervix. The instrument is made of vulcanite, by Arnold & Sons, of West Smithfield, London. It is possible that one of platina could be made smaller and equally serviceable, but the expense of such an instrument would be considerable. I believe this instrument will prove of value in facilitating the treatment of intra-uterine disease.



Of numerous cases of endo-metritis, which I thus treated, I shall give very briefly the details of three. The first was evidently totally unconnected with pregnancy, her last child having been born twenty years previous to her coming under my care. She had also been a long time a widow. Ten years ago menstruation suddenly ceased, and she suffered from headache and dizziness. These symptoms yielded to treatment, and menstruation again became normal. Four years elapsed and then the periods began to become more profuse, were attended with very severe pain, and occasionally clots were expelled, their passage being followed with but little relief. Leucorrhœa was present during the interval between the periods. She also suffered from constant pain in the left side, felt most intensely at a point midway between the spine and crest of the ilium. This pain, at first experienced only at each menstrual period, became, after a time, constant, being aggravated in intensity during the periods, sometimes, indeed, becoming at those times absolutely intolerable; there was also tenderness over the right ovary. The uterus was tender to the touch, was enlarged and retroflected. The introduction of the sound caused much pain and some blood followed its withdrawal. The cervix was swollen and much engorged. To relieve this condition I punctured it, it bled freely, and, hoping to lessen the ovarian congestion, I directed 15 grains of the bromide of potassium to be take thrice daily; this treatment was continued in for some time; blood being extracted locally at intervals of five days. The result was that the cervical engorgement was removed, menstruation became somewhat less profuse, and the ovarian pain much mitigated in severity; but treatment having been discontinued for a short time, the whole train of bad symptoms returned, and I became convinced that no permanent relief would be obtained unless I treated the interior of the uterus directly. I accordingly explained my views as to the nature of her case to this lady and to her son, himself a surgeon. She consented to undergo any treatment which promised relief from her sufferings. I commenced by introducing five pieces of sea-tangle bougie into the uterus; these dilated the cervical canal so freely that I passed my finger through the os internum and up to the fundus of the uterus; as I had anticipated, I detected a rough granular condition of its lining membrane, the lip of the uterus was then seized with a vulsellum and drawn down, and a wire armed with a roll of cotton thoroughly saturated with the fuming nitric acid, was passed up to the fundus and retained there for some seconds; this was done twice so as to secure a thorough cauterization of the whole interior of the uterus. I had the advantage of Dr. Denham's assistance in this case, and he can testify to the thorough manner in which the cauterization was performed. The patient was not chloroformed as she objected to being so. No pain followed. I kept this lady in bed for some days as a precaution, but no other treatment was adopted. The next period came on a little before its time and was profuse, but attended with less pain than previously. Since then her condition has steadily improved, the periods now last but three or four days, and are almost painless. This lady had been treated in various ways, without benefit, before she came under my care. I may here remark that if the nitric acid be applied shortly before a menstrual period, that period is likely to be profuse, but this by no means indicates that the treatment is a failure, the subsequent ones, as in the present instance, frequently becoming normal.

The next is that of Mrs. ——, aged twenty-six. She was confined prematurely of her first child in December, 1870. She was not able to nurse, and recovered very slowly. For some months subsequently she menstruated at regular intervals, the flow not being at first excessive. She suffered, however, constantly from leucorrhœa which debilitated her greatly; for this she was treated by the exhibition of tonics and by vaginal injections without benefit. In the July following her confinement she observed that the menstrual period was not only greatly prolonged, but that the quantity of blood lost was excessive. From this date till the month of October, menstruation recurred regularly at intervals of fourteen days, the flow lasting very profusely for seven days. The period which occurred immediately before my seeing her, commenced on the 18th October and lasted for a fortnight; on the fifth day of the flow, after having been, unfortunately, obliged to pass the greatest part of the night in attendance on an invalid, she was attacked with severe pain which she referred to a point immediately above the pubes; this pain was very intense, and had not entirely subsided when I saw her.

On making an examination I found that the uterus was very low in the pelvis; the cervix was soft, tumified, and tender to the touch; the fundus was evidently enlarged, anteflected to a considerable degree, and very sensitive, the slightest pressure causing great pain. The sound passed with ease to the depth of three and a half inches, but on pressing the point against the fundus she immediately complained of the great pain she experienced. The cervix when exposed to view was seen to be in a state of extreme congestion, while a copious glairy discharge issued from the os uteri.

The diagnosis was clear; an attack of acute endo-metritis had occurred in a uterus which was in a state of sub-involution, the acute attack having now passed into a chronic form; endo-cervicitis was also present. Puncturing the cervix was, in this case, productive of marked relief. The endo-cervical discharge became much less copious, and the tenderness on pressure was greatly diminished, and vaginal aspect of the cervix assumed its normal appearance; yet menstruation continued profuse, and was attended with great pain. This patient resided some distance from town, and I would not venture to dilate the cervix in a patient whom I could not watch. I accordingly, several times, used the nitric acid in the mode recommended by Dr. Sims and Dr. Thomas, but no improvement followed. I therefore decided to introduce ten grains of the solid nitrate of silver up to the fundus, and leave it there to dissolve. This I accordingly did. A good deal of pain followed the application, but it subsided in a few hours, and the patient rapidly improved. Menstruation became normal, and now, after the lapse of a year, she continues quite well.

In the last case which I allude to the symptoms were in many respects very different from either of the former. The patient had borne six children, the last nearly ten years prior to her coming under observation. Ever since its birth she had suffered from menorrhagia, with profuse leucorrhœa, in the intervals between the periods. Of late the flow had become very excessive, lasting from sixteen to seventeen days; but exhausting as this continuous drain was, she complained even more of irritation of the bladder, which compelled her even at night to micturate every hour, or at most every two hours, and during the day the desire to do so was constantly experienced. In her the vaginal aspect of the cervix and the cervical canal were perfectly healthy, but the fundus was enlarged, globular in shape, and its cavity elongated.

The diagnosis was, in this case, obscure; the menorrhagia could be accounted for by the presence of an intra-uterine tumour. The excessive vesical irritation, manifested by the incessant desire to micturate, was not, however, a usual accompaniment of the latter affection. A correct diagnosis could only be arrived at by a digital examination of the interior of the uterus. To effect this the cervix was fully dilated; it disproved the existence of any tumour, but detected a roughened granular condition of the lining membrane of the body.

In this case, also, I cauterized the whole interior of the uterus very freely with fuming nitric acid; no pain followed, nor was any special treatment subsequently needed. The night following the day on which the operation was performed the patient slept soundly, without an opiate, and for the first time for years was not disturbed by the desire to micturate. I had a letter from this poor woman recently, and she speaks with delight of the comfort she now experiences. This case is interesting in proving not only how obscure may be the symptoms, and how severe the sufferings occasioned by disease of the mucous membrane lining the cavity of the uterus, but also for how long a period these cases continue.

In the last case the particulars of which I have detailed while irritation of the bladder and menorrhagia were constantly present, there was no cervical inflammation, and the uterus itself was but little tender to the touch. I therefore did not practise any preliminary treatment, but proceeded at once to explore the interior of the uterus, and finding that the mucous membrane lining it was in a granular condition, I applied the fuming nitric acid freely, with the most satisfactory results.

I desire to impress on the Society the fact that nitric acid properly and carefully applied to the interior of the uterus is a perfectly safe and painless and at the same time efficient application. I do this the more emphatically, because a writer in the number of the Edinburgh Medical Journal, for February, 1872, thus expresses himself with reference to the subject:—

"Patients treated as he (Dr. Atthill) suggests, will certainly have no more menorrhagia, they may be glad if they have even a uterine cavity left." And again, a little further on—"The treatment is one which may have been tried, but which we are pretty sure has never been carried out."

Now with respect to the last of these assertions I have only to state, that in common with many other members of this Society, I have repeatedly applied the fuming nitric acid in the manner described, not only in the presence of other practitioners, but also of a large class of pupils. In the majority of these cases the cervix and os internum had previously been so freely dilated as to permit the passage of the index finger up to the fundus, for the purpose of exploring the interior of the uterus. It is also commonly the practice in this city to apply the fuming nitric acid to the cavity of the uterus, after the removal of intra-uterine tumours, the cervix being sometimes so fully dilated, as, in one of my own cases, to have permitted the extraction of a polypus as large as a turkey's egg. In all these cases the os was not only exposed to view by means of the duck-bill speculum, but the uterus was drawn down and firmly held by means of a vulsellum fixed in the anterior lip. Under such circumstances there can be no doubt but that the interior of the uterus was freely cauterized, that the uterine cavity remained was subsequently proved by examination, and that it had been restored to health was evinced not only by the fact that the distressing symptoms under which the patients laboured had been removed, but further and in an unequivocal manner by pregnancy having in some cases followed. It is needless to say more on this subject, except to express regret that a writer in a medical journal of high repute should express decided opinions on subjects of which he is plainly ignorant. I have seen pelvic cellulitis follow the application of the liquor of the perchloride of iron to the cervical canal, but I have not ever seen an unpleasant symptom follow the use of the nitric acid.

In conclusion, to guard against misapprehension, I think it right to add that, in advocating this method of treating endo-metritis, I must be understood to refer only to cases in which hæmorrhagia, purulent discharges, or profuse uterine leucorrhœa exist, or to cases in which other means have, on a full and fair trial, failed to effect a cure.

Dr. Churchill said he rose to express his sense of the value of Dr. Atthill's paper. He believed that our recent knowledge of the pathology of the uterine cavity was the greatest advance that had been made of late years.

It would be within the recollection of many that he (Dr. C.) had read before this Society, and afterwards before the Medical Association, a paper on granular inflammation of the cervical canal. Since that time the use of the multiple tangle tents, for which he was indebted to Dr. Kidd, had enabled us to examine not only the cervical canal, by the endoscope, but the entire cavity of the uterus. In one such case at the Rotunda Hospital the rectum tube of the endoscope was passed to the fundus, and every portion of the cavity plainly seen. He had found general redness, or redness in patches, with or without the glistening granular appearance which he described as seen in the cervical canal.

He could bear testimony to the value of the free use of strong nitric acid. It neither gives pain, nor is followed by unpleasant consequences, perhaps because it does not make a deep slough. He had been using it freely for the cervical canal for a great many years, and for the entire cavity for some time.

Dr. Ringland said the Society was greatly indebted to Dr. Atthill for his able paper, in which he had given so full and complete a history of the symptoms and the treatment of this formidable disease. He thought the last observation he had made, in commenting on a review that appeared in a Medical Journal, on his (Dr. Atthill's) admirable papers on this subject, was a correct one, viz., that the review in question was the production of a gentleman commenting on a mode of treatment of which he had no experience. He fully endorsed what Dr. Atthill had said of the introduction of solid caustic into the cavity of the uterus. As to the application of nitric acid to the interior of the uterus, he was not aware until lately that Dr. Marion Sims had been in the habit of using it; in fact, he thought that he (Dr. Ringland) himself was the first to suggest the use of it. A paper was communicated some years ago to the Society by Dr. Kidd on the removal of intra-uterine polypi, and he detailed a case where they occurred again and again, necessitating frequent operations for their removal, and accompanied on each occasion with great hemorrhage. On consultation he (Dr. Ringland) suggested the use of nitric acid in that case to check the growth. He had been in the habit of applying nitric acid to the cervix, and he had known of its application in the case of hemorrhoids, with the result of inducing a healthy action in the vessel itself. Seeing a large amount of hemorrhage in cases of cancer of the uterus, it seemed to him that the same thing might be applied there, and that solidification of the vessels of the uterus might be effected.

The result proved that he was right. It struck him that hemorrhage in the cavity of the uterus, resulting from polypi or other causes, might be effectually controlled by the same means, and he suggested the application of nitric acid to Dr. Kidd and the late Dr. Beatty. They seized upon it, and he thought the paper read by Dr. Atthill showed that it was not altogether an unimportant or unwise suggestion.

Dr. J. A. **Byrne** expressed his full approbation of the line of treatment Dr. Atthill had advocated. He thought it was one seldom attended with danger. Although nitric acid would appear at first to be a very severe remedy, yet after all, the wound it produced was a very superficial one, and the amount of suffering caused was not great. They knew this by its application to syphilitic ulcers; and it would appear that it did not produce a slough, but some alterative effect on the surface of the uterus. He fully concurred with Dr. Atthill, and joined him in condemning statements which, if not refuted, might have produced a very injurious effect in preventing the application of this valuable remedy.

Dr. **Evory Kennedy** took the same view as Dr. Byrne of nitric acid, namely, that it sounded more severe than it really was. It acted over a large extent of surface, did not go very deep, and produced a very healthy sore underneath. His attention was first called to it with a view of dealing with malignant disease, and he carried it out very largely, certainly before 1846. When he first made the application he was somewhat apprehensive as to what the result might be; but there never was hemorrhage, never any inflammatory action, and he never found any serious result from it. In some cases, especially those equivocal phagedenic cases, he had found it to act most satisfactorily, the result being that a healthy action was set up. He had used nitric acid in the interior of the uterus, and had never seen any unfavourable result. He did not believe the interior of the uterus took on adhesive inflammation, nor had he ever seen cellulitis produced as the result of the application of nitric acid—*Dublin Journal of Medical Science, Jan.* 1873, *p.* 78.

73.—INDUCTION OF PREMATURE LABOUR.

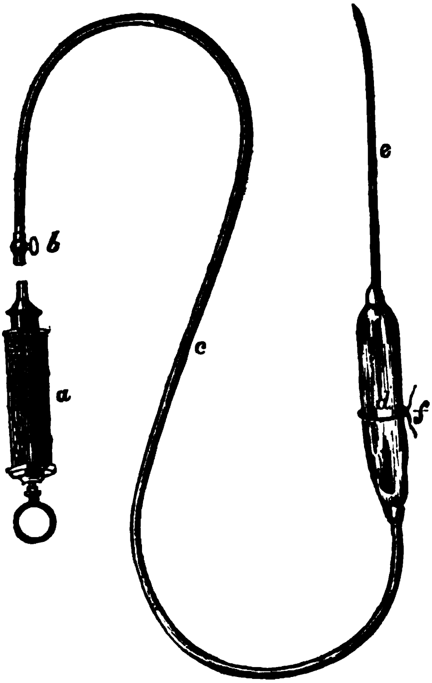
By **Walter Whitehead**, Esq., Surgeon to St. Mary's Hospital for the Diseases of Women and Children, Manchester.

Of the numerous methods at our disposal for the induction of premature labour, the one advocated and introduced into practice by the distinguished author of "Lectures on Obstetric Operations," is the one now all but universally adopted by the profession, not only in this country, but on the continent. Dr. Barnes recommends the following procedure: first, overnight, pass an elastic bougie six or seven inches into the uterus, and coil up the remainder of the instrument in the vagina. Next morning some uterine action will have set in. In the afternoon, at an appointed time, proceed to dilate the cervix by means of hydrostatic bags, rupture the membranes, and then, either by leaving the rest to nature, by turning, by the forceps, or by craniotomy, complete delivery.

The success of this procedure depends upon the retention *in situ* of the bougie for a sufficient length of time to induce uterine contractions by detaching the membranes along its course, and upon the irritation it conveys to the fundus. The failures with this plan are almost invariably to be attributed to the bougie escaping from the uterus immediately after introduction, or at least before it has fulfilled its object. Dr. Barnes relies upon the coil he gives the bougie in the vagina, and I have twice done the same; but having on the last occasion had to repeat the operation, I decided with the next opportunity to attach the bougie to an air pessary, in the hope that by its combination I should be able to fulfil two objects—1. Keep the bougie in the uterus; 2. Dilate the vagina and thus facilitate the ulterior stages of labour by acting as an additional excitant; and, moreover, expanding the channel through which the head is to pass.

Fig. 1 represents the instrument prepared ready for introduction. To render this more easy of execution, a piece of twine is tied round the centre of the collapsed pessary, which, on being inflated, assumes a balloon shape; and the ligature, in consequence, slips to the narrow end. The instrument can either be introduced through a speculum or without, just as the operator may think proper. When the pessary is inflated, as shown in *fig.* 2 (see page 184), the small tap at the end of the tubing is turned and made secure by means of a little sticking plaster, and then passed through an aperture made in the centre of a perineal bandage, which is to be worn attached to a second band passed round the loins. It is advisable before using the bougie to soften it, and there is no better plan of doing this than by placing it for a few moments in warm water, and then anointing it with olive oil.

Fig. 1.

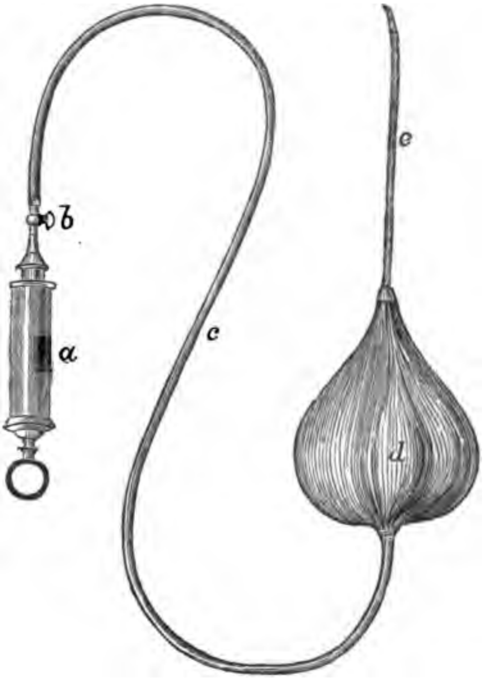


I have now used this safe and efficient plan of inducing premature labour six times; the more interesting details of the cases I append, not only as illustrative of the instrument I describe, but because I consider all such cases interesting in themselves, when we remember the number of deaths which formerly took place from the premature mechanical arrest of gestation.

Case 1.—M. H., æt. 33. She has been married nine years, and has had five children, all born dead at full term. Each confinement had been tedious, and all the children had either been delivered by turning or forceps. I first saw her on the 14th of Dec., 1869, suffering from retention of urine which, upon examination, I found to depend upon retro-version of a pregnant uterus. After emptying the bladder, I restored the uterus to its normal position, and took the opportunity of ascertaining that there existed a pelvic deformity sufficient to account for the difficulties which were stated as having been experienced with the birth of each child. Taking all the circumstances of her case into consideration, I decided that arrangements should be made to induce premature labour at the end of the eighth month. As she had ceased to menstruate for the last time August 14, 1869, I calculated, according to the formula of Barnes, rom the day after the cessation, 280 days, and allowing 20 days for a margin f safety, I fixed April 28, 1870, for her delivery; on the day previous, at

12.45 p.m., I introduced the bougie into the uterus, and on the following day a living male child was born at 3.45. Half an hour before the birth of the child I arrived, and found the os dilating; this I furthered by the use of the largest hydrostatic bag, and immediately proceeded to turn. She made a more rapid convalescence than she is stated to have done after any of her previous confinements.

Fig. 2.



Case 2.—G. E., æt. 24. Epileptic. Married seven years, and had had three children born dead, generally prematurely, and in each instance delivered by forceps. A month before her confinements she had invariably become dropsical, her feet, legs, and body swelling to most distressing dimensions. An estimate, with a pelvimeter, of the pelvic proportions, gave a conjugate of a little over 3·00″; hence I fixed, in accordance with the rule adopted in Case 1, May 25, 1870, to accomplish delivery. On the evening of the 24th, I introduced the bougie, and the following evening Mr. Runcorn, the resident obstetrician of St. Mary's Hospital, delivered a living female child.

Case 3.—E. T., æt. about 30. Married six years. She went to the full period with four children, and had to be delivered of them all by craniotomy. When next she became pregnant, I decided to bring on labor at seven months, and admitted her into St. Mary's Hospital with that object October 24th, 1871. The same day I introduced the bougie at 11.15 a.m., and promised to visit her the next day about the same time, which promise I fulfilled, and at once commence to dilate with the bags. In about fifteen minutes the os admitted the left hand, and, a knee being easily got hold of, I turned. Delivery was completed ten minutes afterwards. The child, a female, required the diligent exercise of artificial respiration before any evidence of life could be obtained; but eventually Mr. Runcorn, who had taken charge of the child, succeeded in exciting a cry, which was the earnest of a future vigorous existence. The pelvis was very much contracted, so much so, that no ordinary child at full term could possibly have been delilvered alive. The mother and child subsequently did very well.

Case 4.—Mrs. F., æt. 29. The mother of one little girl, had also had two boys, delivered by forceps, dead. From the difficulties I experienced with the forceps in her last confinement, I decided, should she again become pregnant, that I would induce premature labour at the eighth month. On January 2, 1872, being the time fixed upon, I introduced the bougie, at 9.30 a.m. At ten next morning, I introduced the largest bag for five minutes, turned and delivered a puny boy, who required upwards of an hour's anxious care to establish constant respiration. At three months of age the child was quite plump and strong.

Case 5.—M. A. B., æt. 35. Was admitted into St. Mary's Hospital on the recommendation of a medical man who had attended her in her last confinement, and who wrote, that in his opinion labour ought to be induced this time at the eighth month, as he had found the vagina cicatrised, and contracted to such an extent that the possibility of a living child being born was very remote. On February 8, 1872, I introduced the bougie, and expected to have found the uterus in a condition for delivery the next day, but, notwithstanding the bougie having remained in position, no alteration had taken place. The instrument having been withdrawn, and a copious secretion syringed from the vagina, it was re-introduced, and another day allowed to pass. On the evening of the next day labour set in, and Mr. Runcorn delivered a dead child. I believe in this instance delivery could have been accomplished much earlier had the bags been used. I look upon the presence of the dilated pessary as having been useful in extending the contracted vagina; and, although the child was born dead, there was no evidence to show that death arose from compression.

These cases go to prove the truth of Dr. Barnes's remarks that "labour may always be completed with safety within twenty-four hours." I had a sixth and most interesting case, which was in St. Mary's Hospital in the early part of 1870, but having lost the notes of the case, I am unable to give the details. She was paralyzed, and suffered from extreme pelvic distortion. All her children had been delivered by craniotomy. I provoked labour at the seventh month, and perforated; thus saving the woman a further month of suffering and lessening the difficulties which would, as previously, have been experienced in effecting delivery.—*Liverpool and Manchester Medical and Surgical Reports*, 1873, *p.* 170.

74.—REMARKS ON A NEW MIDWIFERY FORCEPS.

By Dr. Francis Vacher, Birkenhead.

Since Chapman published a description and engraving of the instrument used by the Chamberlens, it has been so often altered and improved that a proposal to increase the armamentarium of the accoucheur by the addition to it of yet another modification of Dr. Paul Chamberlen's wonderful invention may well appear uncalled for.

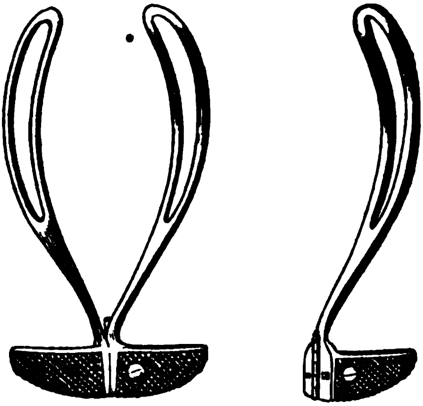
In a recently published illustrated catalogue of surgeons' instruments, appliances, etc., issued by a well-known firm, I find cuts of no less than thirty forms of midwifery forceps; and yet these are only a few selected instruments kept in stock by one London house, and represent a mere fraction of the number the ingenuity of the profession has devised. Indeed, perhaps, it is not beyond the truth to say, that of all those who, during the last one hundred and forty years, have taught and laboured to advance the science and art of obstetrics, nearly every one has left his name on a pair of forceps. With all this, the forceps now ordinarily in use in this country are essentially the same as the original instrument—improved, I grant, in shape and proportions, in lock and handles, but the same in principle, the same in practice; that is to say, a pair of vectes to be introduced separately, and then joined so that each may act as a fulcrum to the other. The old fixed pivot joint, commonly called the German lock, is now, in most instruments of British make, replaced by Chapman's lock, or Dr. Bond's modification of it. Smellie and Levret added a second curve, called by Mulder *curvatura nova*, and by Taylor Smith the pelvic curve, to distinguish it from the cranial curve. Smellie also increased the length of the shank, thus making the first long forceps, and substituted wooden handles for hooked iron ones. More recently, Sir James Simpson altered the shape of the handles, and added cross stops, to give additional traction power. Dr. Zeigler increased the width of the shank of one blade, and introduced a slot in it continuous with the fenestrum, for passing over the handle of the other blade, insuring apposition, and facilitating application. Whether Assilini's old-fashioned forceps, the blades of which do not cross, or Dr. Radford's asymmetrical device for grasping the fœtal head antero-posteriorly instead of laterally, and many other ingenious contrivances it is not necessary to particularize, can be justly called improvements on the most primitive forceps is at least doubtful. Some men have "invented" a new forceps for the sake of slightly altering the shape of the blades, some merely to vary the breadth of the blades or the size of the fenestra, some to increase or lessen the length of the handles, or the distance between the blades when the handles are in perfect apposition. In brief, I would submit, that with all the improvements which have been made in the instrument during nearly a century and a half, the forceps in the present day most used in Great Britain, which I take to be Denman's for the operation in the cavity of the pelvis, and Simpson's or Ramsbotham's for the high operation, do not differ strikingly from the Chamberlens' instrument. Simpson's and Ramsbotham's differ in four particulars; the blades have a second curve, the shanks are lengthened, the locks altered, and the handles modified. Each of these changes, considered alone, is but slight, yet together they have so improved the practical utility of the instruments, that, as a long forceps, Sir James Simpson's is as near as possible all that can be desired. Denman's, inasmuch as it has wooden handles and Chapman's lock, is an improvement on the original instrument; and as Denman's, or forceps closely resembling his, is the form of short forceps commonly employed in this country, it is probably the best we have.

It cannot, however, be said of short forceps that it affords us the ready, simple, mechanical help we require when the fœtal head is well down in the pelvic cavity. It is as formidable an instrument as the long forceps, almost as difficult to apply; its use requires to be preceded by the same precautionary preparations—moving the patient to the bed edge, emptying the bladder and rectum, etc. The same tedious conference with the patient's friends has to be gone through, the same formal explanation of the operation and the necessity for it to the patient, the same unwillingness to be overcome, and the same alarm excited, as if instrumental delivery from the superior strait were contemplated. The short forceps, such as we now have it, is in truth the same instrument, except as regards size, as the long forceps, and patients and their friends naturally have as much dread of one as the other. Until it can be so modified as to be quite a different intrument from the long forceps, less formidable, easier of application, these fears of the patients and their friends must always weigh with the practitioner, and often induce him to delay assisting the descent of the head long after such delay is dangerous to mother and child, or to resort to ergot, which, if the labour be tedious from slight disproportion, is so apt to be fatal to the child.

Such a modification of the short forceps I think I have been so fortunate as to devise. It was constructed for me from my drawings, by Messrs. Weiss and Son, of London, in May last, and now that I have tested its utility, and find it has more than answered my most sanguine expectations, I bring it before the notice of the profession.

I have said that the ordinary short forceps (Denman's) is an improvement on the most primitive instrument only in respect of the lock and handles. My forceps, as will be seen by referring to the wood-cut, differ from Denman's and from every other form of short forceps, both in lock and handles.

The instrument may be described as consisting of two blades or clams, essentially the same as those of ordinary short forceps, except that the lower blade is slightly shorter than the upper, being adapted to lie within it when the instrument is closed. At the lower extremity, or but, of each blade, bent at an acute angle to its convex surface, is a handle, rounded off and slightly curved like a small horn. The handles are of black wood, but the bases, which are perfectly flat, are faced with steel, as are also the parts directed towards the blades, the steel being continuous with the blades. Along one



edge of the handles' bases, and extending into the shanks of the blades, is a stout hinge, and near the opposite edge is a strong steel snap. The measurements are:—

Length of the whole instrument, 8¼ in.
Interval between the blades at the widest part, 3½ in.
Interval between the points of the blades, 2 in.
Greatest width of blades, 1⅝ in.
Length of each fenestrum, 4¼ in.
Length of each handle, 2 in.
Depth " 1 "
Breadth " ¾ "
Length of hinge, 1⅝ in.

The edges of the blades and fenestra are, of course, neatly bevelled off, and the upper or outer blade projects beyond the other sufficiently to prevent the possibility of the soft parts of the mother being caught. It should be mentioned also that the blades, when the instrument is closed, only lie perfectly close at the lower margin; along the whole length of the upper margin they are separated about an eighth of an inch—an arrangement necessary to enable the blades to pass one another.

The instrument is calculated, as are other short forceps, for delivery of the head when it is in the cavity of the pelvis, and when it has in great part emerged from the pelvic canal and rests on the perineum, and the circumstances which call for its use are the same as those demanding the application of the ordinary short forceps, that is to say, arrest of the head at the pelvic outlet, from inertia of the uterus, from slight disproportion, from mal-position, &c., or from any condition of the mother or child likely to peril either in the event of delivery not being completed.

The method of proceeding with the instrument is as follows:—The patient being presumed to be on her left side, with the thighs flexed upon the abdomen; the operator, having the forceps (close and well warmed and oiled) in his right hand, introduces two fingers of his left hand through the ostium vaginæ. The ends of the blades are then slipped along the palmar surface of the fingers, conducted to the head, and guided by the fingers as far as they will reach, passed between the head and the hollow of the sacrum, the blades' ends being made to hug the head all the way. The ends of the handles, which of course point directly towards the anus, are now slowly and carefully separated with both hands, until their bases are in exact apposition, when the instrument locks of itself. The index finger of the left hand may now be passed into the rectum, and the margins of the blades felt to the right and left, and those using the instrument for the first time might satisfy themselves of the position of the blades, when introduced, by this simple means. If the forceps has been skilfully applied, the handles, when locked, will be in a line with the transverse diameter of the pelvis. The two handles united are next grasped like a corkscrew handle, and traction applied in the ordinary way. When the head has been drawn down so far that a finger introduced into the rectum can hook on to the right or left supra-orbital arch and retain it in position, the forceps should be unlocked, folded, and carefully removed.

The old rules,—that forceps be introduced during an interval, great care taken that no soft parts or hair are included in the lock, and that traction be made during the pains, where there are any, and intermittingly like pains where there are none, and always in the direction of the axes of the pelvis,—I need hardly say should be borne in mind by anyone using my instrument, the same as if he were using another.

I have said delivery may be effected by the forceps I am writing of, (1) when the head is in the pelvic cavity, and (2) when it has in great part come through the outlet. In the second class of cases, the blades, when locked, will lie nearly evenly over the ears, the parts usually grasped by ordinary short forceps. In the first class of cases the head will be caught obliquely, much as it would be at the brim by the long forceps,—that is to say, where the head is in the first position, the end of the upper blade of the forceps, when locked, will rest on the temporal ridge of the right side or half of the frontal bone, the lower blade end on the mastoid portion of the left temporal bone; and where the head is in the second position, the end of the upper blade will rest on the right mastoid, the lower on the ridge on the left half of the frontal. The third and fourth positions will generally have changed into the second and first by the time the head is wholly in the cavity.

I am aware there is nothing new in grasping the head obliquely when it is in the pelvic cavity. Though not the practice usually advised in text books, it has its advocates. Some practitioners apply the short forceps in this way as a rule, and others must needs do so occasionally when the caput succedaneum is so large that it is difficult, or impossible, to diagnose the position of the head with certainty, or where introduction of the blades in the oblique diameter of the pelvis, so as to clasp the head laterally, is impracticable. Neither do I claim there is anything new in passing a blade into the hollow of the sacrum and then bringing it into position,—it is recommended by no less an authority than Sir James Simpson,—nor in passing both blades together into the hollow of the sacrum and slipping them right and left,—it was suggested, upwards of three years ago, by Dr. Braithwaite, the editor of the well-known *Retrospect of Medicine*. I admit also that there is no novelty in short clubbed handles—Professor Inglis had such handles fitted to Simpson's blades, and called the "improvement" by his name.

I do not claim to have invented a new short forceps, nor to have discovered a new way of applying that instrument; but I do claim to have devised a lock more suitable for the short forceps than Chapman's, Ziegler's, or the German lock, or any modification of either of these, and a folding handle, like a corkscrew handle, meant for traction only. Both lock and handle are new so far as I know, and in respect of them the forceps is essentially new, and differs from the Chamberlens' instrument more than any short forceps yet contrived. That it is a perfect instrument I do not assert, but I am convinced the principle on which it is constructed is sound, and that in it we have the essentials of a more useful and perfect short forceps than any hitherto brought before the notice of the profession. In conclusion, I submit the following propositions regarding the instrument:—

1. That it is smaller, lighter, and more portable than any other form of forceps.
2. That it is altogether a different instrument to the long forceps, could not be confounded with it by a patient, and is as little likely to alarm the most timid as the whalebone fillet.
3. That it can be more easily and quickly applied than any other form of short forceps.
4. That it may be applied without subjecting the patient to the preparations

considered necessary before using the ordinary forceps—placing her across the bed, bringing the hips to the bed edge, emptying the bladder, etc.

5. That it may be introduced, and the blades brought into position and locked, almost without the patient being conscious an instrument is being used, and certainly without the pain caused by the pressure on the vagina and labia required to keep the blade ends of the ordinary forceps in close contact with the head during introduction.

6. That it cannot fail to lock, and does so without the metallic clashing almost impossible to avoid when other instruments are used.

7. That it cannot slip.

8. That with it, as with no other forceps, traction is effected without compression. This I take to be a great advantage, for pressure on a child's head during delivery often brings on convulsions which may be fatal, sometimes paralyses the portio dura, sometimes permanently impairs the brain and produces idiocy.

9. That the simple transverse handle is better adapted for traction, less cramping to the hand, less fatiguing to the operator than any other, not excepting the handles with short cross stops.

10. That it is a vectis no less than a pair of forceps, and when folded may be used as that instrument to assist the rotation of the head, correct malpositions, and as a lever-tractor, the operator making a fulcrum of his left hand, and drawing with his right.—*Liverpool and Manchester Medical and Surgical Reports*, 1873, *p.* 77.

75.—ON CEPHALOTRIPSY.

By Dr. J. Wallace, Assistant Obstetric Physician to the Liverpool Ladies' Charity and Lying in Hospital.

Case 1.—Mrs. T., æt. 36, was taken in labour on Sept. 4, 1870. At the end of two days, as the labour made no progress, I was asked to see her by the midwife in charge. The patient was a dwarf, hardly three and a half feet in height, with broad shoulders and hips; and the lower extremities presented a remarkable appearance of shortening, from bending and twisting of the bones of both thigh and leg, caused by rickets. The contour of the abdomen was unusually prominent, the uterus lying forward and over the pelvic arch. She was in good spirits, and her general health was satisfactory, although for more than a year she had felt a difficulty in walking from weakness in the back. She was the mother of two living children, and had not previously required any assistance in labour. Osteo-malacia, and jutting forward of the sacral promontory as a consequence, probably accounted for the formation of the distorted bony passages. On examining per vaginam, I found the os uteri well dilated, its anterior lip somewhat oedematous, and the pelvic brim shaped in the form of the figure of eight, from bending forward of the sacro-vertebral angle, and bending backward of the horizontal ramus and of the symphysis pubis. The antero-posterior or conjugate diameter measured about two and a half inches, while the transverse was normal. The pelvic malformation was therefore of the most common form met with. The rectum and bladder having been emptied, I applied the long forceps with much care to the head, which was lying transversely at the brim, and resting on the pubes. I then sent for the cephalotribe (Kidd's), a stronger instrument, and asked my colleague Mr. F. W. Lowndes to assist me and Mr. Wood, the then resident house surgeon of the Ladies' Charity [illegible]. [illegible] Mr. Wood to steady the uterus, I applied the straight forceps of [illegible], but they failed equally with [illegible]. [illegible] the uterus, [illegible] and [illegible] in any way and I [illegible] a [illegible] upon the result of the operation. The forceps had failed and there was every reason to believe that the child was not alive, [illegible] determined [illegible] four hours and the membranes had been ruptured at that time. I determined at once to resort to cephalotripsy. I performed an eight [illegible] plied the cephalotribe, crushing the fœtal head, vault and base, so completely as to enable me to finish the labour without any difficulty. The head was crushed and flattened. The patient did well, and was up and going about before a week had passed. I was much struck by the ease of this method of operating as compared with the old one of crotchet or cranioclasm. This was the first successful cephalotripsy which had been done in Liverpool. My next case was even more satisfactory, when the greater urgency of the symptoms and the less favourable condition of the patient are considered.

Case 2.—Mrs. K., æt. 17. August 13, 1872. She was taken in labour with her first child on the previous day, and was under the care of an old woman, who left her suddenly when convulsions set in. The friends, then, with an order from the Ladies' Charity, got a midwife at 4 a.m., who requested my immediate attendance. Mrs. K. was a cripple; her left knee-joint being ankylosed, with the leg bent at right angles to the thigh, and withered; the thigh of the same side not half so well developed as that of the other limb, and the hip-joint and pelvis correspondingly small. She was moreover almost or quite deaf, and the squint I had noticed as she lay in convulsions (eclampsia) was natural to her. I administered chloroform, and, on examination, found the os uteri well dilated, the head at the brim with a large caput succedaneum, and resting on the sacral promontory, which was jutting forward and narrowing the conjugate diameter by fully one inch and a half. The pelvis was small but equal laterally. I applied the long forceps (Simpson's) and brought down the head a little, after which it got completely locked and could not be moved farther downwards. I then determined on performing cephalotripsy, and sent for my colleague, Mr. F. W. Lowndes, while I went for the instrument—the midwife, in the meanwhile, keeping the patient under chloroform, thus completely controlling the convulsions. Mr. Lowndes tried the forceps, and I again put them on (not Simpson's, but Churchill's straight instrument); but it was impossible thus to forward delivery. I therefore perforated and applied the cephalotribe, crushing the vault, and base partly, and brought the head down to the outlet, where again it was arrested. I then re-applied the instrument and crushed the base completely, and brought it down still further, when its progress was again arrested. The shoulders and chest now opposed delivery. I accordingly applied the cephalotribe over the left breast and right shoulder-blade and crushed very thoroughly, after which delivery was completed without any further difficulty. This was the first time this latest and last modification of the Edinburgh instrument invented by Sir J. Y. Simpson was used; and I must here own that it did its work easily and well. The patient came out of the influence of chloroform and remained well for a time, but the convulsions again attacked her. Fifteen-grain doses of chloral, given every half hour, relieved her after she had taken a drachm and a half, and then she had no return of the convulsions. On the second day consciousness was complete, and she had emptied the bladder without help.

Now as regards *the operation;* the performance of which will appear to most accoucheurs formidable and dangerous, and most assuredly it will be so in the hands of the rash or inexpert. Hemming records 200 cases, of which 161 recovered and 39 died. Dr. Wm. Jones tabulated the cases in the Hospital of the Clinique at Paris during the years 1857, 58, and 59, and out of a total of 24 operations 7 were fatal and 17 recovered; but in eight instances the contractions were below 2¾ inches, and five of these were fatal, whilst amongst those above 2¾ inches there were 14 successful operations out of 16. In craniotomy with the perforator and crotchet the mortality is about 1 in 5¼. I feel sure that cephalotripsy, skilfully performed at the proper stage of the labour, will very considerably reduce the maternal mortality, not only because of its superiority over the older operations, but, also perhaps, for the same reasons that craniotomy and crotchet in the hands of some accoucheurs are very much less fatal than in the hands of others. In doing the operation it is necessary,—

1st. To perforate. Some have objected to this as unnecessary, but the experiments of Nersent show that all the diameters except one are lengthened on an average seven-sixteenths of an inch when the cephalotribe is applied without previous perforation, but after perforation the increase was only from one-sixteenth to three-sixteenths of an inch.

2nd. Apply the blades of the cephalotribe in the same manner as the long forceps.

3rd. Grasp the fœtal head well forwards towards the pubis of the mother to crush the vault of the cranium, but towards the sacral promontory if the base of the skull is being crushed, and screw the handles together.

4th. Break up the head by repeated applications of the crushing power if necessary, and extract as if by long forceps. Nothing is to be gained by delay, as recommended by Pajot.

5th. Perforate and eviscerate thorax and abdomen if necessary, and crush the thorax and pelvis with the cephalotribe if extractive efforts fail. To do so thoroughly it may be requisite to decapitate, and afterwards to remove the crushed parts as they are brought within reach.—*Manchester and Liverpool Medical and Surgical Reports*, 1873, *p.* 149.

76.—ON THE TREATMENT OF CERTAIN FORMS OF MENORRHAGIA AND UTERINE HEMORRHAGE BY MEANS OF THE SPONGE TENT, WITH SPECIAL REFERENCE TO THEIR OCCURRENCE IN WOMEN RESIDING IN TROPICAL CLIMATES.

By Dr. George Granville Bantock, Physician to the Samaritan Free Hospital.

[We are accustomed to the use of sponge tents as a preliminary to other treatment of uterine disease, but in this paper the use of the sponge tent is itself the treatment recommended. The author considers that it has a modifying influence upon the nutrition of the parts upon which it presses, controlling congestion and tendency to hemorrhage.]

Before proceeding, however, to record the cases which illustrate the subject I may be permitted to ask the question—What is a sponge tent? This may appear to many to be a trivial question, but I can assure them, if such there be, that it is an important one, and that much depends upon its right solution. There are at the present time, in the market, specimens which, though in outward form they are very elegant, have no claim to the name of sponge tent except from the fact that they are seen to be made up of a piece, or pieces of sponge, and whose use tends only to bring discredit on the instrument. Not long ago I introduced one of these into the uterus of a patient and I took the precaution to retain it *in sitû* for several minutes, and to enjoin perfect quietude for an hour and a half. My injunctions as to rest were strictly obeyed, and water was freely used to ensure full dilatation. Nevertheless, twenty-four hours after, I had the mortification of finding that not only had the tent slipped into the vagina but that it was scarcely larger than when first introduced. In view of such a circumstance I may be excused for shortly entering on the subject of their manufacture.

In his original memoir on the "Detection and Treatment of Intra-uterine Polypi" (published at p. 122 of his collected works by Drs. Priestley and Storer) the late Sir J. Y. Simpson recommended that the sponge should be steeped in a solution of gum previous to compression; but the editors were careful to append a note to the effect that experience had proved this to be unnecessary. This appears to have been overlooked by subsequent writers; for Dr. Black, in the recently issued volume of the same author, adheres strictly to the original memoir. Dr. Marion Sims, admirable though his directions in other respects are, commits, what appears to me a greater mistake in recommending that the sponge should be "thoroughly saturated with a *thick* mucilage of gum arabic." I have used tents apparently made in this way and have as often been disappointed with the results. The tent, when fully dilated, presents somewhat the appearance of a lump of jelly; the gum forms a covering to the sponge and fills up the interspaces or canals, and this effectually prevents that action which is one of the principal objects, as will hereafter be explained. Good sound sponge of medium texture requires no addition of gum in the manufacture of tents of all sizes. The fine and close Turkey sponge as well as the "honeycomb" sponge, is not suitable for the purpose, the former being deficient in resiliency and the latter in power. The only disadvantage attending the use of sponge tents made in the way recommended, is the readiness with which they absorb moisture. This is best met by carefully selecting a tent that will readily enter the cervical canal, and in some cases, such as flexions and versions, by using a suitable speculum, and fixing the uterus by means of Sims' hook, and, if necessary, straightening the organ. Whether a speculum be used or not it is necessary that the tent be covered with a thin coating of a mixture of wax and lard. I use the proportions of one of wax to three of lard. This coating should not cover more than half the sponge. Of late I have been in the habit of moistening the sponge, previous to compression, with a watery solution of carbolic acid one in twenty, and I am satisfied that it prevents, in a great measure, the very unpleasant smell which otherwise always attends the use of the sponge tent.

I have thought it quite unnecessary to describe the exact process of manufacture, seeing that as it has been so graphically done both by Simpson and Sims, every one must be presumed to be acquainted with it.

I pass to the more immediate subject of this paper, viz., the treatment of certain forms of menorrhagia and uterine hemorhage by means of the sponge tent. The following cases illustrate the subject:

Case 1.—Mrs. C., æt. 30, mother of six children, was married at the age of 18, a year after her arrival in India. Four months after the birth of her second child she began to suffer from menorrhagia accompanied by great disturbance of the digestive system. She bore four children more, and the menorrhagia increased *pari passu*, so that at last she was compelled to leave the country. Several of her labours were accompanied by post-partum hemorrhage, especially the last. The periods recurred with tolerable regularity between the third and fourth week, but the quantity was so excessive that a fatal result was more than once apprehended. Ice and all the usual hæmostatic remedies were of no avail. She came home by the Cape of Good Hope in a sailing vessel, and such were the beneficial effects of the long sea voyage that the menorrhagia ceased. Not so the derangement of the digestive system. Soon after her return to this country, and after being for some time under the treatment of Sir James Simpson, she again became pregnant and was delivered at full term. The menorrhagia returned, and she was subjected to a variety of treatment both in Edinburgh and London; she had her cervix divided for supposed fibroid tumour, and was subjected to another operation at the same time. I had an opportunity of examining her almost immediately after the division of the cervix, and could find no trace of fibroid tumour, or even induration. The menorrhagia was in no degree restrained by this operation, but, on the contrary, owing to the increased facility given to the escape of the blood, it was rather worse. The uterus was not larger than should have been expected in the case of a multipara, after a rather recent confinement; its texture was devoid of that solidity which is characteristic of its normal state, it was soft and flabby, the os and canal of the cervix were patent so as almost to admit the tip of the index finger: a No. 13 catheter—gum elastic—readily entered the cavity and fluid injected through it returned in full stream alongside. She came under my care in February, 1857, at which time—some months after the date of my first examination—the condition of the uterus was substantially the same as above described, and the menorrhagia no better. Her general health corresponded. She was in a state of great anæmia, unable to walk a very moderate distance without great fatigue and prostration, and rarely left the recumbent position. During the menstrual periods she was confined to bed, and the free use of stimulants was required to ward off a distressing feeling of faintness. I tried all the hæmostatic remedies such as iron, ergot, gallic acid, Indian hemp, &c., internally and locally, the cold douche by continuous stream (Sansom's douche), injection of sol. fer. perchl., &c. During this course of treatment she was seen by three of the most eminent obstetric physicians in London, at whose suggestion some of the above remedies, and in different forms, were administered. Still the menorrhagia went on. Residence at the sea-side produced very slight improvement in her general condition. Looking back at her history I suggested a sea voyage, but it was found impracticable. At last the idea occurred to me of trying the effect of a sponge tent. On her return to town from the sea-side, and on the 1st of October, 1867, I passed a large sized sponge tent, recently made as I have already directed, and rather more than two inches long, through the internal os, and left it for twenty-four hours. The next period showed a decided improvement. On November 28th, I passed another: the result was still more satisfactory, all the former remedies were discontinued, the menstrual flow became reduced to a degree often exceeded by what is in some persons normal, and altogether she was so improved that she was able to return to India in the following October, having spent the preceding summer and autumn months in various parts of the country, without any treatment whatever. Previous to her departure she passed a fortnight in really hard work, purchasing, packing, &c. A few months after her return to India she again became pregnant, and was delivered at full term on May 18th, 1870. The menorrhagia returned, but not with its former severity. She is now in this country, having come back in July of this year, 1871; although her menstrual periods are abundant, they are not sufficiently so to require any treatment.

Case 2.—Mrs. W. came under my care as an out-patient at the Samaritan Free Hospital, suffering from excessive menstruation as well as intercurrent discharges of blood. She was the mother of several children, and until the commencement of her present symptoms had enjoyed good health. She had suffered from a slight increase of menstruation since the birth of her last child, between two and three years ago, but it was within the preceding few months that it had acquired its greatest severity, and that she had become the subject of intercurrent discharges. There was considerable leucorrhœa, chiefly vaginal. She had gradually—more rapidly of late—become weak and anæmic, and could hardly bear the walk from Lisson Grove to the hospital.

On examination the uterus was found to be slightly increased in volume: the cervix thickened but not indurated, the os patulous, its mucous membrane thickened, soft, spongy, and granular. The passing of the sound caused rather free bleeding. I administered iron alone and in combination with ergot, gallic acid, &c., but without any effect on the bleeding. Local remedies, such as cold douche and astringent injections, were of no use. After some hesitation I determined to try a sponge tent, and accordingly I introduced one of medium size and the patient returned home. Next day, with some degree of anxiety and apprehension of the result—as it was the first time I had attempted the treatment in out-patient practice—I visited the patient at her own home and removed the tent. It had acted extremely well—whether this was due to its containing no gum, or whether the copious sero-sanguinolent discharge set up had washed it all out I am not prepared to say—and held its place firmly, its meshes interlocking with the lining membrane of the cervical canal, and it was only by first passing the finger around the tent and successively pressing it away from the opposing surface that I was able to withdraw it. There was a very abundant watery discharge, excessively offensive: the vagina was immediately washed out with a solution of chlorate of potash (5 grs. to oz.); she was ordered to keep her bed for a couple of days and to continue the tr. fer. perchl. which she was then taking. At the end of the week she presented herself at the hospital.

From that time the intercurrent hemorrhages ceased, her menstrual periods assumed normal proportions, and in a few weeks she was discharged. I met her accidentally some months after and she stated that she was quite well. More recently she has been again under my care, but for dyspeptic symptoms.

Case 3.—Mrs. T., æt. 24, a native of Calcutta, of very dark complexion, from a considerable infusion of Indian blood, began to menstruate at the age of fourteen; the periods recurred very regularly every month, and lasted from six to eight days, the total amount of discharge being above the average, but unaccompanied by clots. She married at the age of seventeen, and two months afterwards had a miscarriage. Her next period assumed the character of menorrhagia with clots. Repeated miscarriages at varying intervals took place, amounting to a total of seven, the last occurring in September, 1868, at the fourth month, after a voyage to the Mauritius for the benefit of her health.

During her pregnancies she always suffered from slight hemorrhages at irregular periods. From the date of her last miscarriage the menorrhagia was so severe as to compel her to keep her bed for the whole period of from five to seven days. On the first day she usually complained of rather severe pain in the "waist;" on the third and fourth days large clots passed; and at the end of the period she was in a state of great prostration, from which she had scarcely recovered before the next period was upon her. In addition to this she suffered from frequent attacks of pain of a sickening character in the lumbar region, during the intervals of menstruation, and these were usually accompanied by a more or less decidedly sanguineous discharge. She sought advice in various quarters and was subjected to a variety of treatment, local as well as general, but deriving no benefit, and receiving no definite information as to the nature of her disease, it was determined that she should seek advice in London. The opinions pronounced on her case were various, one of them being that she was the subject of a tumour; another was to the effect that she required an operation. The removal of the supposed tumour, or whatever condition required operation, was the cause of the long journey. She menstruated for the last time in India from the 26th to 31st March, 1871 (inclusive), passing many clots, and she was taken on board ship on 3rd April, per Suez Canal,—being then in a very weak state. There was a scanty discharge on the 20th and 21st April; and again on 15th May there was a slight "shew." On 25th May she landed in England. This patient came under my care on 10th June. She had not been unwell again but complained very much of the frequency and severity of the attacks of the pain above mentioned, but without discharge of any kind. Her general health was very good, having undergone great improvement on the voyage. She had experienced a similar result from her voyage to the Mauritius, but the improvement was only temporary. On that occasion, it should be noted, her pregnancy extended to the fourth month.

Diagnosis.—On external abdominal examination not even the suspicion of a tumour was aroused, but vaginal examination revealed the following condition:—The uterus was of normal size, both as measured by the sound, and by the combined external and internal manipulation; there was a slight anteflexion; the os was patent; the whole cervix soft and flabby; the mucous membrane of the anterior lip especially, felt as if loosened in its submucous connections. Before placing her under treatment, and after having explained the nature of her disease and the treatment I proposed, I recommended her to obtain the opinion of one skilled in the treatment of uterine disorders. Accordingly on the following day she accompanied me to Mr. Spencer Wells. The result was a perfect agreement as to the absence of any tumour and the presence of the condition described. Nor was there any difference on the question of operation, while we were agreed as to the treatment to be pursued.

Treatment.—On 12th June, a small sponge tent was introduced and left for twenty-four hours; another was introduced on the 19th and removed on the 20th, and on the latter day I prescribed 10-minim doses three times daily, of the tr. fer. mur. and extr. ergot liquid. The menses appeared on the 29th and lasted three days, moderate in amount and not preceded by pain. There were no clots, nor was she compelled to keep her bed. She was allowed to pass over a month without another tent, and on 23rd July the menses again appeared. The quantity was greater, and there were several small clots. On this occasion I gave her a few doses of gallic acid. On the 29th she was complaining of the old pain and was rather disheartened. For this I prescribed gr. ½ extract of Indian hemp to be taken every four hours while the pain lasted, and to be had recourse to on each recurrence. On 2nd August I passed a small tent, and on the following day another of larger size. Neither of these acted well as they were saturated with thick gum. On the 9th I introduced another of medium size, of same make, and next day had the mortification of finding it in the vagina little changed. However, I placed it by another, and this by a third on the 11th, and the result was satisfactory. (These latter tents were made by myself for the occasion, and the sponge was merely moistened with the solution of carbolic acid. They were quite devoid of unpleasant smell on extraction.) To make sure work (as the patient limited me to time), I introduced another on the 16th. This acted perfectly, opening the cervix well. After the use of the sponge tents the vagina was washed out daily with a solution of ten grains of tannin in two ounces of water. The menses appeared on the 23rd and lasted three whole days; the discharge was moderate, and the patient was not confined to bed at all. From this time she ceased to complain of pain. On September 21st she again became unwell, and the discharge ceased on the fourth day. During the whole of this menstrual period she went about sight-seeing daily without inconvenience of any kind.

Result.—On the 10th October she sailed for Calcutta in a state of perfect health, rejoicing as much at the cessation of the attacks of pain as of the menorrhagia. During the last month all treatment, local and general, was suspended.

Remarks.—These three cases are good examples of that form of uterine hemorrhage and menorrhagia to which I have desired to call attention, which is not described definitely in our text-books, and in the treatment of which the sponge tent is so valuable. There is no tumour, no fibroid thickening or induration, nor is there a polypus. The condition is one of relaxation of the tissues of the uterine body to some extent, but especially of the mucous membrane lining the cervical canal, and probably that of the uterine cavity—if I may be allowed to adhere to the established nomenclature for the sake of convenience, without prejudice to the question whether it be a distinct membrane, or a layer of soft tissue. This state of relaxation permits congestion or stasis of blood to take place in the vessels of the submucous tissue (or layer of soft tissue), which, deprived of their necessary support, readily pour out their contents either under the influence of the menstrual molimen, or any influence acting locally or generally, and leading to congestion of the pelvic organs in their entirety, as occurs in the somewhat analogous case of hemorrhoids. In all the cases which have come under my notice the patients have either resided in India, and have been more or less liable to miscarriages or post-partum hemorrhages, or they have been resident in this country and have dated their illness from a miscarriage or delivery at term. These are not cases of subinvolution. I refer more particularly to the cases of residents in tropical climates (the term is not once mentioned by Dr. Tilt in his special chapter, to which I shall have occasion to refer more at length); for in Case 1 the uterus is described as being in no degree larger than is usual in women who have borne half a dozen children, while in Case 3 the size of the organ could be so easily measured by the combined external and internal manipulation, and the estimate thus formed was so exactly confirmed by the use of the sound that the idea of subinvolution could not be entertained. To the naked eye, when seen through the speculum, the everted mucous membrane of the cervical canal is seen to a much greater extent than usual, and its redness tends to lividity. Pressed with the sound or any hard substance, the tissues yield to a greater degree than in their normal state, and the passing of the sound often draws blood. As a rule there is decided leucorrhœa—in Cases 1 and 3 it was not abundant—but I have never seen the os and cervical canal blocked up with glairy mucus, so characteristic of the so-called "catarrh" and inflammatory conditions of the uterus. Nor is there any increase of temperature. When examined by the finger the mucous membrane can be felt to slip over the subjacent tissues as if too loose. In Case 3 this was so well marked as to lead to considerable increase in the size of the anterior lip; and the disappearance of this condition was coincident with the cessation of the menorrhagia.—*Obstetrical Transactions, vol.* xiv., *p.* 84.

77.—THE SUBCUTANEOUS INJECTION OF EXTRACT OF SECALE CORNUTUM UPON FIBRO-MYOMA OF THE UTERUS.

Prof. **Hildebrandt**, of Königsberg, has recently been experimenting on this agent in certain diseases of the uterus. His first case was that of a woman aged 33, who was suffering from a fibro-myoma of the uterus, and who had profuse menstruation (though this occurred but once a month), followed by very abundant fluor albus, and accompanied by severe uterine pains and spasms, with a feeling of weight in the abdomen. These symptoms she had experienced for three years. The tumour had attained such a magnitude that the uterus appeared equal in size to that of a woman in the twenty-eighth week of pregnancy. Many remedies had already been tried, as iodine, both internally and externally, ergot, perchloride of iron and lead. Compressed sponges and laminaria had been used to dilate the orifice of the uterus, and to render the tumour accessible to surgical interference; but these measures had to be given up on account of the great tenderness of the os uteri.

Prof. Hildebrandt now determined to try the effects of the daily subcutaneous injection for fifteen days, into the walls of the abdomen, of three grains of the watery extract of ergot in glycerine. Menstruation was induced, but the quantity was materially diminished. The tumour now began to diminish, and five weeks after the commencement of the injection had entirely disappeared. The sound could be introduced to its normal extent, the fluor albus and pain were abolished, and menstruation was rendered regular. After this singularly successful result, Prof. Hildebrandt adopted it in nine other cases of uterine fibroids, and found it successful in all but two. In one of these the use of the remedy had to be given up, owing to toxic effects, and in the other on account of the extreme pain accompanying the subcutaneous injection. He recommends the employment of the ergot in solution in glycerine rather than, as Langenbeck proposes, in alcohol, on account of the less pain occasioned by the former solution, and he finds the most convenient part to be the vicinity of the umbilicus rather than the inferior part of the abdomen, on account of its lower degree of sensibility. To prevent the escape of the fluid from the wound after it has been injected, he recommends that the orifice should be touched with collodion, and a pad of cotton-wool applied.—*Practitioner, Dec.* 1872, *p.* 380.

78.—ON JUNOD'S BOOT AS A REMEDY IN SOME FORMS OF AMENORRHŒA.

By Elizabeth Garrett-Anderson, M.D.

The difficulty often found in restoring the menstrual flow when it has been suddenly suppressed by cold or nervous shock is sufficiently well known to render it needless to apologise for mentioning a new or unfamiliar remedy. It is notorious that all drugs supposed to be emmenagogue in character are apt to fail when but for the absence of the catamenia the patient would appear healthy. The most trustworthy of the group, iron, probably fails far more often than it succeeds when given in the absence of symptoms of anæmia, and as a rule anæmic symptoms are not present when menstruation has been suddenly and as it were violently suppressed. These are, moreover, precisely the cases in which remedial measures are most urgently needed. In the more common forms of amenorrhœa, where the condition appears to depend upon immaturity, change of air, anæmia, phthisis, or general debility, the suffering directly due to the absence or irregularity of the menstrual loss is generally very slight, and the remedies, when any are needed, can be allowed to act slowly. In the sudden suppression of menstruation from cold or nervous shock, the case is very different. All the symptoms are urgent. The headache is violent, the face is flushed, the eyes congested, the pain in the back severe and the general excitement great. The physician who might treat this condition on the expectant method would probably have few opportunities of doing so twice on the same patient. But the remedies at disposal are lamentably uncertain. Several of the best on the list, such as hot hip and foot baths, mustard baths, hot whiskey toddy, hot bottles to the feet, pennyroyal tea, and colocynth pills, are usually applied without medical advice. The external application of leeches, though less uncertain than most remedies of its class, often fails. Leeches applied internally, nitrate of silver to the os and cervix uteri, galvanic intra-uterine pessaries, and other direct stimulants to the interior of the uterine cavity, are inadmissible in the case of young unmarried women, for whom even stimulating vaginal injections would be ordered with considerable reluctance.

It is in cases of this kind, where the more ordinary and semi-domestic remedies have failed, where the distress from cerebral congestion is great, and where the suppression of menstruation has been sudden and has appeared to be due to some external or non-constitutional cause, that Junod's apparatus appears to me to promise to be of use, either as a palliative or as a cure. Essentially it is a dry-cupping on a large scale. The leg is enclosed in an air-tight case, and the air exhausted over it. The result is, that for the time the capillaries and vessels of the leg enlarge, more blood remains in the limb, and the circulation in other parts is proportionately relieved. It has the great merits of not interfering with other treatment, of being quite painless and so easily regulated as to be practically harmless, and of being applicable to young girls. I have tried it in two cases, and in each the return of the menstrual flow appeared to be the result.

In both cases the suppression dated from a violent chill during the catamenial period. In the first, the menstrual molimen was not very severe, but there was more or less constant headache and great depression and restlessness. There was no anæmia, and all ordinary remedies had been skilfully and actively applied under medical advice for some months before I saw the patient. The first remedy I tried was faradisation, placing one pole over the lumbar vertebræ, and varying the position of the other over the ovarian and uterine regions. I also extemporised an arrangement by which it was possible to apply the poles directly to the vaginal surface of the cervix uteri without using a speculum. After each application the patient said she felt for some hours as if the loss would shortly begin, but we were always disappointed. My patience failed after about six or eight trials, and I resolved to see the effect of Junod's boot at the next monthly period. After it had been applied twice, each time for about forty minutes, the flow appeared, and it has since returned regularly. Even after the first application the headache was relieved, and the general aspect of the patient unmistakably improved.

The second case was marked by much greater urgency in the symptoms. The suppression had occurred suddenly two months before I was consulted, and both at the time of the suppression and during the next succeeding period of molimen all the usual remedies had, I was told, been actively applied by the family doctor in the country. When I saw the patient the headache was severe, the skin hot, and the pulse quick and feverish. Very hot sitz baths, with cold lotions to the head, a small blister to the neck, and two leeches on the thighs, relieved the headache, but did not bring on the flow. The next day, faradisation, and an ammoniated vaginal injection and more hot baths were tried, without effect. Two days afterwards the headache returned to an intense degree. I then applied Junod's boot; and while it was on, the face became less flushed, the dull, pained, oppressed expression lightened, and the patient declared herself better. The application lasted forty-five minutes. The leg was considerably swollen at its close, but the patient comparatively comfortable. The catamenia appeared the same evening. It is of course impossible to say how much, if any, of these results was due to the cupping process.

It is quite possible that the credit ought to be given to some one of the other remedies, or to all of them, or to none. Where the suffering of the patient is urgent, the desire to remove it naturally outweighs any leaning one would otherwise feel towards making a trustworthy therapeutical experiment—*Practitioner, Dec.* 1872, *p.* 859.

79.—ON THE ESSENTIAL CAUSE OF DYSMENORRHŒA, AS ILLUSTRATED BY CASES OF PARTIAL AND COMPLETE RETENTION.

By Dr. Robert Barnes, Obstetric Physician to St. Thomas's Hospital, Examiner in Obstetric Medicine to the University of London and the Royal College of Surgeons.

[Not many years ago dysmenorrhœa was almost universally regarded as a purely nervous affection. More accurate methods of investigation have, however, shown that it is associated with distinct morbid conditions of the uterus. There is still a great divergence of opinion upon the subject.]

If we postpone theory and carefully analyse a large number of cases, noting the complications and the effects of treatment, we shall find that the cases of "irritable uterus" resolve themselves into the following groups, namely—1, in which there is manifest enlargement from congestion of the uterus; 2, in which there is subinvolution with chronic inflammation of the uterus following labour or abortion; 3, reclination or flexion of the uterus, most frequently retroflexion; 4, a projecting conical vaginal-portion, with very small os externum uteri; 5, disorder of distant organs, attended or not by one or more of the preceding structural faults, and almost always with impaired sanguification and nutrition; 6, a morbid condition of the ovaries; and lastly, a residuum of cases in which, whether from not pushing investigation to the proper point to discover the associated fault, or because there really is no physical fault, we are obliged to conclude that the dysmenorrhœa is simply the expression of nervous disorder. We may reasonably expect that advancing knowledge of uterine and ovarian pathology will still further diminish this residuum.

I think observation warrants this general conclusion:—The healthy well-formed uterus is rarely an "irritable uterus" or associated with dysmenorrhœa. Or the case may be stated as follows:—For menstruation to occur healthily and easily, the genital canal, from its commencement at the fimbriated extremity of the Fallopian tubes to the vulva, must be freely pervious. In the course of this canal there are three natural constrictions, namely, at the os uterinum of the Fallopian tube on either side, at the os internum uteri, and at the os externum uteri. It is at these points especially that difficulty is apt to arise. But if extreme narrowing occur at any other part of the canal, as in the vagina, similar results will follow. If the closure be complete, and menstruation takes place, of course there will be retention. If the closure be incomplete there will be partial retention, the expression of which is dysmenorrhœa. This partial retention and dysmenorrhœa we know is extremely common. Its phenomena should, I think, be studied in connection with those of complete retention. We shall find in this study endless illustrations of the proposition that one essential condition of dysmenorrhœa is *retention of menstrual secretion.* There is another condition to which retention of secreted matter is not necessary. In many cases where there is congestion of the uterus combined with extreme nervous susceptibility, the pain is most marked at the onset of the period, that is, in all probability, before any pouring forth of blood into the uterine cavity has taken place. The pain is explained by the sudden distension of the morbid uterine tissue by the gathering of blood in the vessels preliminary to secretion. A close analysis will, however, resolve these cases also into the same class as the first. In both there is retention, the difference being that in the one case the menstrual blood is retained in the cavity of the uterus after secretion, and that in the other case the blood is retained in the tissues of the uterus. The point which brings both cases together is that there is difficult excretion, causing distension of the uterine fibre and nervous irritation.

The residual cases, which do not fall under the one or the other description of retention, are rare indeed.

[Dr. Barnes then related numerous cases in illustration of his opinions, but in the discussion which followed, several eminent practitioners dissented from him.]

Dr. Playfair said that every one would willingly admit the great value of the paper which Dr. Barnes had read, and the interest of many of the cases he had brought forward. The view which he so strongly advocated had been equally strongly upheld by Bernutz and Goupil, and other writers. It would, no doubt, be very satisfactory if we could explain the suffering connected with dysmenorrhœa by the presence of one condition alone. It would unquestionably greatly simplify our study of the affection. Unfortunately, however, it appeared to him that clinical facts were not in accordance with a theory so seductive from its simplicity. He had no wish whatever to throw the least doubt upon the mechanical theory as explanatory of a large number of cases. On the contrary, he believed it to be a very frequent cause indeed, and an important one. Many of the cases Dr. Barnes had brought forward conclusively proved this. But then several of these were of quite an exceptional character, such as only come under the observation of a practitioner of his great experience. Others, such as flexions of the uterus, fibroids, etc., are, no doubt, active causes of the painful menstruation, and can only be remedied by the removal of the obstructing cause. But besides these he was inclined to think that there are a far larger number of cases than Dr. Barnes allowed where nothing of the kind can be found. Take for example those, so frequently met with, which have been classed under the head of congestive dysmenorrhœa. Here the pain is entirely or chiefly felt before the menstrual secretion is established; the moment that comes on the bleeding relieves the congestion and the pain vanishes. Clearly there can be no menstrual retention in the ordinary sense here, but even these cases Dr. Barnes refers to the same category by an hypothesis which, to say the least of it, seems a very remarkable one. He says these cases resolve themselves into the same class as the others, "the difference being that in the one case the menstrual blood is retained in the cavity of the uterus after secretion, and that in the other case the blood is retained in the tissues of the uterus." But surely there is all the difference in the world between pain which results from the efforts of the uterus to expel what is practically a foreign body in its cavity, and pain which results from the presence of an undue amount of blood in the vessels of the organ? Pain of the latter class is common, not only in the uterus, but all over the body, and it is just such a condition that produces the pain of a gum boil or some similar affection, and here, as elsewhere, the pain is relieved as soon as loss of blood relieves the loaded vessels. No doubt, in the large majority of these cases there is some local condition of the uterus which explains the congestion, and which should be carefully searched for, such as chronic inflammatory condition of the uterus or a morbid state of its lining membrane. It is because these exist that the congestion of the menstrual nisus produces pain, which it should not do in a healthy state of the uterine structures. It should be noted, too, that in many of these cases the cervical canal is found to be morbidly patulous rather than constricted. Then there is a class of cases of some importance to which Dr. Barnes makes no allusion, which may be described as cases of ovarian dysmenorrhœa. In these the pain has probably nothing to do with the uterus at all, but would seem to depend on the changes going on in the ovary in connection with maturation of the Graafian follicle, and the discharge of the ovum. In these the pain is more or less distinctly referable to the site of the ovary, and not unfrequently the enlarged and tender ovary can be felt on vaginal examination immediately before, after, or during the menstrual period. While, therefore, fully admitting the importance of mechanical causes of dysmenorrhœa, he believed that we should be taking a more philosophical and correct view of the affection if we did not try to force our explanation of them too rigidly into one groove.

Dr. Snow Beck quite agreed with the remark that this paper was founded on erroneous principles, which, if adopted, would lead to improper practice, especially in the virgin. Pain, or increased pain, at the menstrual period—dysmenorrhœa as it was termed—was an attendant on most of the diseases of the uterine organs, and one of the distressing ailments, often a most troublesome one, from which the female frequently sought relief. It would be impossible to go over, at the present time, the various diseases which induce this pain, many of which had little relation to each other. But it might be stated broadly that it was induced by any defect in the menstrual secretion, either congenital or acquired, or by any alteration of the uterine organs from a condition of health, either congestive, inflammatory or structural. Not unfrequently it arose from deficient development of the uterine organs, apart from any mechanical obstruction to the menstrual flow, and sometimes appeared to depend upon an unusual nervous susceptibility of the individual. No doubt it every now and then was caused by a mechanical obstruction to the menstrual flow, whether this arose from congenital defect, or from an acquired alteration, the result of some previous disease. But these were only exceptional cases when compared with the frequency with which it was met with as a symptom of other diseases. The idea of this mechanical obstruction was a very seductive one; had been frequently taken up by different observers, and as frequently dropped after further experience as being a very inadequate explanation. He was unable to understand the statement that when the obstruction did not occur in the natural cavities of the organ it was caused by obstruction in the tissues. Dr. Barnes did not mention the particular types or tissues in which this supposed obstruction occurred, or the changes in these tissues by which it was accomplished. It was, he suspected, one of those imaginary statements too often indulged in and made without any sufficient foundation in ascertained facts. Some of the classes of cases met with in every day experience were alluded to to show that in most of them there was no clinically observed fact sufficient to justify the statement that obstruction was "essentially" the cause of this pain. The case mentioned by Dr. Barnes, where a lady, after her confinement, complained of pain during menstruation, and on examination the sound passed 8½ inches, did not afford any evidence of obstruction. Since attention had been directed to these cases they were found to be of too frequent occurrence. The whole of the uterus remained enlarged, the external orifice often so patent as to admit the end of the finger; the cavity of the neck was large; the sound readily passed the internal orifice, and, by the freedom of the motion allowed, evidently entered an enlarged cavity in the body. The vagina also was generally large and ample, and the menstrual flow came away freely and without the least evidence of any coagula, yet was attended with great pain. No doubt, in many of these cases, there was a bending of the uterus forwards or backwards, but the attending pain was not greater in those cases than in others where the organ was found to be straight. Sometimes relief was afforded by passing the sound through the internal orifice, which was followed by the escape of a small amount of blood; but where this proceeding succeeded once it failed in the large majority, and was often so painful that the women after a few trials declined to have it further repeated. Again, these enlargements of the uterus were every now and then met with where the menstruation appeared naturally, and without any increase in the usual inconvenience; and the absence or presence of the attending pain appeared to depend upon the condition of the blood-vessels. In the examples where the pain was increased all the vessels were enlarged; the arteries, the veins, and the capillaries, and the organs were greatly congested; where there was little attending pain the enlargement of the organs existed without the accompanying congestion. He suspected it was these latter cases which had been described as fibroid enlargement of the whole of the uterus. In other cases met with in the virgin and in women who had borne children the pain and accompanying distress was more intense. The condition of the organs was also different. The great enlargement was not present; but the organs, sometimes both the vagina and the uterus, were hot, very sensitive to pressure; the introduction of the sound into the uterine cavity caused severe pain, and the arteries pulsated strongly and quickly under the fingers of the observer. Whether the condition was called chronic inflammation, active congestion, or whatever term, it appeared pretty evident that the severe pain during menstruation was produced by the increased congestion attending the menstrual function; much in the same way as the increased pain induced in an inflamed part whenever it is allowed to remain in a descending position; and this explanation appeared to be confirmed by the relief afforded by the local abstraction of blood, whether by the application of leeches or by scarification. In another class of cases, by no means unfrequent, and met with in the virgin as well as in the married female, the pain arose from irritation, or chronic inflammation, of the vagina, where obstruction was totally out of the question. In these cases the pain came on two, three, or four days previous to, and ceased, or was much relieved, on the appearance of the menstrual flow, was of a constricting character, attended with shooting pains up the vagina and bearing-down feelings, the pain being seated deep in the hypogastrium, in the groins and lower part of the back. He was aware that those cases were usually described as of ovarian origin, but was convinced that this error arose from want of careful observation. That these symptoms arose from affections of the vagina was well shown in the case of a young lady, which proved fatal, and was published by the late Mr. Obré, in the British Medical Journal for 1857. In another class of cases this vaginal irritation or congestion appeared to depend upon great constipation of the bowels, and was often met with in the virgin. Pain in the head, want of appetite, distress after taking food, and general languor were the attending symptoms, when on enquiry the bowels were found much constipated, being relieved once or twice a week and insufficiently. Gradually pain came on at each menstrual period, deep in the hypogastrium and lower part of the back, with shooting pains and bearing down. All of which symptoms passed away after a time when free and regular evacuations of the bowels were obtained, aided by cool and soothing vaginal injections. It was in these cases that guiacum, which had been long recommended for painful menstruation, appeared to be of much service. Again considerable congestion of the rectum accompanied with hemorrhoids, but without any noticeable affection of the uterus, was attended with great pain during each menstrual period, which appeared to be induced by the increased congestion of the pelvic veins accompanying the menstrual period. In fact, nearly all acquired, as distinct from congenital, alterations of the uterine organs from a state of health were attended with more or less increased pain during menstruation, and some affections of the neighbouring organs give rise to a similar increase of pain. The subject of 'The Irritable Uterus' was too long and too complicated to be considered at the present time. In conclusion, he had no hesitation in expressing his belief that obstruction to the exit of the menstrual flow formed but a small proportion of the cases attended with increase of pain during menstruation, and that the treatment directed "essentially" to this object would in the large majority of instances be attended with unfavourable results.

Dr. **Rogers** said that he must dissent from the conclusion, as far as he understood it, which the author of this most excellent and practical paper appeared to have arrived at, and must agree with the opinion of the preceding speakers that dysmenorrhœa was not a disorder depending solely on obstructive causes. Those who, like himself, had been in the practice of their profession over five and twenty years, and before the theory of obstruction was acknowledged and taught to be a cause of this affection, must have cured undoubted cases of dysmenorrhœa, and have known such cases cured in the practice of others. He had been for years physician to the Samaritan Hospital, where at an early period obstruction was recognised to be an important cause of dysmenorrhœa, and several of his colleagues have even invented instruments for operative treatment of such cases, and he had on many occasions used these instruments when other means have failed, and the case required it; and he had operated in similar cases to those brought before the Society by Dr. Barnes. In his opinion many cases occur from other causes, such as ovarian, rectal, or pure neuralgic disorders. It may be remembered by the Fellows that his colleague, Dr. Routh, had read papers before the Society with cases on a form of dysmenorrhœa arising from what he called fundal endometritis, where every care had been taken to eliminate all obstructive cause, and yet the dysmenorrhœa persisted.

Dr. **Tilt** thought the author had failed to make good his assumption that dysmenorrhœa was always caused by the retention of the menses in the uterine cavity, and Dr. Tilt thought it was unjustifiable to give cases of menstrual retention by vaginal occlusion as illustrative of dysmenorrhœa. He thought the most frequent cases of obstructive dysmenorrhœa were those in which the obstruction was clearly spasmodic; cases in which dark blood and blood clot were passed after two or three belladonna-and-opium suppositories had been introduced into the rectum; the cervical canal freely admitting the uterine sounds forty-eight hours after menstruation. He said he had repeatedly met with cases in which dysmenorrhœa was intense, although the cervical canal was perfectly free, the discharge of a florid colour and without clots. The dysmenorrhœa in those cases sometimes depended on chronic inflammation of the menstruating surface, sometimes on morbid ovulation and subacute ovaritis; whereas, in exceptional cases, the complaint would only be considered as a neuralgia of the menstruating womb.

Mr. **Spencer Wells** believed that a very large proportion of cases of true dysmenorrhœa depended upon mechanical impediment to the free escape of the menstrual fluid, and are curable by removal of the obstruction. Sympathetic pains in the breast, or elsewhere, and nervous symptoms common at the menstrual period should not be confounded with true dysmenorrhœa. He had narrated cases in which severe obstructive dysmenorrhœa had been cured by replacement of the flexed uterus, by dilatation of the cervical canal, and by opening a closed vagina. In the last case careful inspection is much safer than using a trocar.

Dr. Barnes, in reply, thanked the speakers for their criticism, which would be exceedingly useful to him. There was no time left to answer each in detail. The criticisms with which he had been favoured had excited in him some surprise. He had anticipated rather being found fault with for bringing before the Society propositions too trite, and which no one disputed. He had not expected to hear so many expressions of dissent. The general tenor of the observations made was to attribute to him a more absolute reference of cases of dysmenorrhœa to retention as the cause than the paper justified. He admitted that there were other causes; he had expressly cited ovarian conditions; but he could not assent to the conclusion that because in many cases of dismenorrhœa pain was referred to the region of the ovaries, the cause in these cases was necessarily due primarily to ovarian diseases. It was just to remember that Henry Bennet long ago pointed out that ovarian pain was symptomatic of inflammatory condition of the uterus. It was also symptomatic of other diseases of the uterus. When these diseases were cured the ovarian pain vanished. Dr. Playfair missed the true application of the cases of complete atresia to the question under discussion. Certainly they were rare, but such a case as the one of the woman menstruating easily whilst the genital canal was healthy, menstruating with increasing difficulty and pain as the closure of the vagina advanced, then suffering all the ills of retention when the closure was complete, and lastly being cured of her dysmenorrhœa when the vagina was restored, afforded a series of proofs to which the best designed series of experiments that could be devised could add little, that dysmenorrhœa was due to incomplete retention. Dr. Snow Beck's anxiety lest the adoption of this theory of retention should lead to mischievous treatment might be allayed by the reflection that if no cause of retention were discovered there would be no operation necessary to remove it. One rule indeed flowed from the clinical observations, namely, that in cases of dysmenorrhœa persisting and injuring the patient's health, examination of the condition of the organs whose functions were impaired should be made.—*Obstetrical Transactions, vol.* xiv. *p.* 108.

80.—THE ORIFICES OF THE UNIMPREGNATED UTERUS, AND THEIR SURGICAL TREATMENT.

By Dr. J. Matthews Duncan, Physician to the Edinburgh Infirmary, and Lecturer on Clinical Surgery.

[A great number of papers have appeared upon this subject in the pages of the British Medical Journal. It was originally introduced by Dr. Matthews Duncan, who published an article, more scientific than practical, upon the comparative dilatory power exercised by the metallic bougie, and the sea-tangle and sponge tents. Dr. Henry Bennet, as will be seen by two of his papers published in this volume (see article 81), is at direct issue with Dr. Matthews Duncan on a point of fact. The former says that the os internum is naturally closed in the healthy uterus except at the menstrual period: the latter that it is not closed but open, or at least so open that very gentle pressure only is required to pass a sound. This is a matter of experience. Our own agrees with that of Dr. Bennet.]

The remarks of Dr. Henry Bennet are, with few but important scientific exceptions, so just, and do so appropiately condemn much of the prevalent gynæcological practice of the day, that I am glad to have an opportunity of expressing my approval of them; and also to explain, however imperfectly, my own views as a practitioner in diseases in which the size of the canal of the cervix uteri is directly or indirectly implicated. This paper is not, like my former one, scientific—it is more of a practical character; and much of what I have to say conveys not facts, but views or impressions, which I meantime firmly believe. A daily and generally a laboriously gained experience in gynæcology of above a quarter of a century finds me very doubtful of the true character of many of my own and others' supposed facts; and I can, in most practical matters, be sure only of honest zeal in the pursuit of truth.

The State of the Orifices of the Uterus.—The orifices of the uterus I have never found closed, except in an occasional rare case of complete atresia of the internal os of the cervix. Using the word stricture in the ordinary surgical sense, I can say that I have never seen or heard of an acquired stricture of the orifices of the uterus or of the canal of the cervix. I have often heard of stricture of the womb; but the term has then been applied in a loose and improper way to instruct or to amuse patients.

Some cases of congenital stricture or partial closure of the external os uteri have occurred to me; but such cases are very rare. This condition and other contractions of the cervical canal do not deserve the name of stricture, because they do not obstruct the passage of uterine mucus or of healthy menstrual discharge (see the Journal of Anatomy and Physiology, November, 1870, p. 150). Plugs of coagulated blood or of dense mucus may more or less firmly close the orifices of the uterus. The external os uteri may be, in a certain sense, closed by being adpressed by the neighbouring vaginal wall. The canal of the cervix and its internal os may be, in a certain sense, closed by swelling of the walls, or by an acute flexion, or by a growth, whether sessile or polypus-like. The external os uteri is larger and more easily dilatable than the internal os uteri. Both are, when in a state of health, at all times easily permeated by an ordinary uterine sound. Except in very rare cases of congenital or acquired contraction of stricture, both ora uteri are, in a state of disease, easily permeated by an ordinary uterine sound. The difficulties, very rarely insuperable, of passing a sound arise from missing the way, not from any obstruction. Both ora uteri may, when in a state of health, be easily and rapidly dilated to a considerable extent. By the use of bougies they may, in a few minutes and without any acute pain being excited, be dilated so as to allow a No. 9 or a No. 13, or even a higher number of the ordinary male urethral series, to pass; or, in other words, to allow a bougie a quarter of an inch in diameter to pass.

In cases of spasmodic dysmenorrhœa, the passage of a bougie, however small, through the internal os uteri causes great pain, identical with that of the spasmodic dysmenorrhœa; and not, in my opinion, identical with the tenderness elicited by the same kind of touching when the mucous membrane is inflamed, as in inflammatory or in membranous dysmenorrhœa. In such cases, the dilatation of the internal os by bougies causes great pain, like that of spasmodic dysmenorrhœa. Further, in such cases the internal os is occasionally small, sometimes transmitting an ordinary uterine probe with a little difficulty; and the dilatation of it must be by very slow degrees, if it is to be done by a gentle or slight force, without causing any split or laceration. The internal os uteri does not recontract to its pristine condition after dilatation, but remains large for a long time (years), if not permanently; at least in many cases.

The Nature of Spasmodic Dysmenorrhœa.—Dysmenorrhœal pains, resembling those of the characteristic spasmodic disease, may be produced by uterine contractions overcoming or attempting to overcome an obstruction. Examples of this are seen in the expulsion of clots, or of dysmenorrhœal membrane, sometimes also, but rarely, in cases of acute flexion of the uterus; but the pains are, in all these cases, generally of comparatively short duration, and not so severe as those of an ordinary bad spasmodic dysmenorrhœa.

I have elsewhere given abundant reason for regarding obstruction or mechanical hindrance of discharge as having nothing to do with the great mass of cases of spasmodic dysmenorrhœa; yet it is well known that the attractive simplicity of mechanical obstruction has given it at present the chief place as a cause in the minds of gynæcologists generally, who accordingly term the disease mechanical dysmenorrhœa.

The pain is spasmodic; it may occur before, during, or after the monthly flow. There is extreme sensitiveness of the internal os uteri and of the mucous membrane of the body of the uterus. It is quite possible that a condition of inflammation of the mucous membrane may exist, but it has not been demonstrated. Many attempts have been made to establish the diagnosis and treatment of chronic inflammation of the mucous membrane of the body of the uterus, but they are in the highest degree unsatisfactory and inconclusive. Although this be true of the present condition of these ingenious attempts, and although they do not throw any clear light on the theory or treatment of this kind of dysmenorrhœa, yet very much may be expected from investigations pushed in this direction.

The process of healthy menstruation has, as has been pointed out, a great resemblance to an acute catarrh—softening and thickening of mucous membrane, intense congestion, secretion of mucus, shedding of epithelial cells, and escape of blood. When conditions similar, but morbid, occur in the bladder, we often have strangury; when in the rectum, we often have tenesmus; when in the bowels, we often have tormina; when in the bronchi, we often have asthma. So it is possible that, whether passing the bounds of health or not, the same conditions in the womb may induce spasms or spasmodic dysmenorrhœa. This is the nearest approach I can make to a theory of spasmodic or so-called mechanical dysmenorrhœa.

To this theory there is the objection, that it does not include and account for the sensitiveness of the mucous membrane of the body of the uterus, and the relief the disease got by dilatation of the internal os of the cervix: at the same time, it is to be observed that these two circumstances are not hostile to the theory, and may be quite reconcileable with it.

The Treatment of Spasmodic Dysmenorrhœa.—This may be divided into two parts; the general treatment, similar to that of all painful spasmodic diseases, and the special treatment of the uterus.

Of the former I need say nothing in this place, as it is well known, extremely unsatisfactory, and has little connexion with the subject which is under discussion. Many cases of dysmenorrhœa recover under this kind of treatment; but it is difficult to apportion the due share of credit to the medicines and to time or the natural progress of the case.

A severe chronic case of dysmenorrhœa tests the powers of medical treatment; and the attainment of good results from it is at least not to be relied on. Yet there can be no doubt that diaphoretics, laxatives, narcotics, warm bathing, and hygienic treatment have a considerable range of utility.

The special treatment of the uterus by mechanical appliances is the only treatment which yields striking good results, and this so frequently in inveterate cases as to leave no doubt as to the direct connexion between the mechanical treatment and the improvement of the case.

Were catarrh of the cervix uteri a cause of spasmodic dysmenorrhœa, then perhaps, good might arise from dilating by incision or otherwise the external os; just as good is said to arise in cases of irritable bladder from dilatation of a urethral stricture, and this even when the stricture is easily permeated by the urine. But I am of opinion that no distinct benefit arises from any kind of dilatation of the external os uteri; for this part has no relations with the disease of which I am aware. Yet it is well known that authors of eminence, as Mackintosh, Simpson, and Sims, recommend this treatment.

Catarrh-like conditions of the mucous membrane of the body of the uterus are present in spasmodic dysmenorrhœa; this mucous membrane is preternaturally sensitive at all times in a woman suffering from chronic spasmodic dysmenorrhœa; the internal os of the cervix, the channel of exit from this cavity of the body of the uterus, is especially supersensitive; this internal os is also frequently diminished in size; it is with difficulty dilatable when compared with the same part in a healthy uterus; sometimes it is extremely difficult of dilatation. These circumstances, and the analogy of urethral stricture above-mentioned, prepare us for believing that some action on the internal os uteri might ameliorate or cure a spasmodic dysmenorrhœa. The action resorted to is dilatation. This is the mechanical treatment which yields striking good results frequently in inveterate cases,—in the worst cases.

In further giving my views on this mechanical treatment, I wish to be understood as expressing only my present opinions and with great reserve. Were it not for the misunderstanding of my views which I have found to exist by reading recent criticisms on my paper on Mechanical Dilatation of the Cervix Uteri, I would not have been induced to express again so early my opinions on this important practical matter.

The means generally resorted to for dilatation of the cervix are short metallic bougies allowed to remain, tangle-tents, and cutting instruments, of which Simpson's and Greenhalgh's are well-known examples. All of these means I have used, and I have had very extensive and long-continued opportunities of becoming acquainted with some of the results of their use in the practice of others. It is these means which have afforded the striking good results of which I have just spoken. But the striking good results, so far as the dysmenorrhœa was concerned, were equalled, if not surpassed, by other striking bad results, hemorrhage, metritis, ovaritis, perimetritis, parametritis, with all their numerous attendant evils and dangers. This kind of dilatation is frequently resorted to by some to remove sterility; and so frequent have these bad results been, so far as I can judge, that, whatever may have been the results as to sterility in some individual cases, I am satisfied that, on the whole, they have caused more sterility than they have cured. The result of all this has been that many practitioners, including myself, have been gradually giving up the use of the remedy by dilatation. The evils and dangers of it, as hitherto practised, are too great, and fully counterbalance the good.

It was under these circumstances that I proceeded to investigate the subject farther, and among other things, resolved to try for the internal os uteri the treatment used for dilating the male urethra—the daily passing of ordinary male urethral bougies slightly modified, which are not allowed to remain, and whose size is day by day increased. This treatment I described in the Edinburgh Medical Journal for May ,1872 (see *Retrospect*, vol. lxvi., p. 232). I have found that the striking good results already mentioned are, at least often, attained; and this, without the occurrence of the striking bad results. I am aware of only one case in which any evil result followed this method of gradual dilatation. In it there was a slight temporary attack of adhesive perimetritis; and I believe that this was the result, not of the treatment as I would now conduct it, but of the use of more forcible dilatation than was necessary.

Future investigations may enable us to discover some class of cases in which the older modes of dilatation are to be preferred. They may also change our views as to the utility of both older and newer.

I resort to dilatation in a virgin rarely, and with extreme reluctance, and only in very severe cases.—*British Medical Journal, March* 8, 1873, *p*. 251.

81.—ON MECHANICAL AND FORCIBLE DILATATION OF THE CERVIX UTERI.

By Dr. Henry Bennet, late Obstetric Physician to the Royal Free Hospital.

I have read with interest the articles of Dr. Matthews Duncan on the mechanical dilatation of the cervix uteri, as also the subsequent remarks of Dr. Atthill and of Dr. Aveling. I quite agree with the latter writers, that Dr. Matthews Duncan has made a valuable contribution to the mechanics of the subject, and has added to our knowledge of what is actually done when *force* is used to introduce a sound or bougie into the cavity of the uterus, either for mere uterine examination or for dilatation of the os internum. I am surprised, however, that none of these gynæcologists have noticed or discussed the doctrinal points which I brought before the British Medical Association in a paper read at Birmingham last August, which was published in this journal in October; yet these doctrinal points are at the base of the entire question of cervical dilatation. In this paper I merely reproduced the views brought before the profession in 1848, in the second edition of my work on uterine inflammation, and which I have repeated, with the authority of increasing experience, in each subsequent edition. I maintain, founding myself on anatomy and physiology, that the os uteri internum is normally closed during life, by a vital contraction of the circular fibres, which prevents, in healthy women, the easy entrance of the uterine sound *at all*, except in some women, not in all, a day or two before, during, and a day or two after, menstruation. In these healthy women force has to be used to pass it; and this force, Dr.

Matthews Duncan tells us, is, in his experienced hands, equivalent to four pounds, an amount of force that would bend a metal sound if exercised at the handle.

Dr. Duncan does not speak of healthy sound women; but I believe his remark applies to them, as he appears entirely to ignore the fact that in healthy women the os is vitally closed physiologically, and evidently considers this healthy vital closure a morbid state, as did Sir James Simpson, from which he has evidently taken this view.

The os uteri internum is actually open so as to admit the uterine sound or an equally large bougie, only, as a rule (to which, however, there may be exceptions), in morbid uterine conditions. It may be thus open in chronic inflammatory disease of the mucous membrane lining the cervical canal or cavity of the uterus, in enlargement of the body of the uterus from whatever cause, from fibroid tumours, from chronic inflammation, or from non-involution after pregancy. In any of these states the circular fibres at the os internum *may* relax (they do not always do so), and may allow a free passage to the sound or bougie. To these states I would add that of some women of very lax fibre, with relaxed vulva, vagina, and abdomen, and with general flabbiness of tissue.

In healthy women, I repeat, as a rule, the os internum during life is closed vitally by contraction of the circular fibre. To consider this condition a morbid one is an error—anatomical, physiological, pathological. Practically, it is a most pernicious error, for it renders nearly every healthy woman who is examined liable to be considered as suffering under morbid closure. Such an erroneous idea leads to unnecessary, unjustifiable surgical interference, to cutting, to forcible dilatation with four pounds' pressure, to dilatation of all sorts and kinds, and that without real necessity.

[In another paper Dr. Bennet says:]

What is meant by all this surgical cutting and dilatation? What is the pathological condition which the dilatation or force is meant to overcome? What is the pathological condition that resists so as to bend a strong silver sound, which can only be overcome by a pressure of four pounds? We know what a stricture is in the male uretha, the fibrous gristly nature of the contraction, and the antecedent pathological conditions; we know that, if we resort to forcible sounding or catheterism, we break through these fibrous gristly structures, and that without probably using a pressure of four pounds. What I wish to know is, what is the actual pathological condition of the cervical canal or of its orifices, external or internal, which leads one physician of eminence in London to divide the os internum with a double metrotome three hundred times in two years in his consulting room, and another in New York to divide the os externum and entire cervix down to its vaginal attachment in five hundred cases in the same period of time? Indeed, I come upon traces of these operations constantly in my practice in all kinds of cases, without finding a clue to the motive that dictated them. These serious operations, not to speak of forcible dilatation of all kinds, appear to me, judging from what I see and hear, to be rashly, blindly carried out, as a kind of surgical panacea for anything and everything—sterility, dysmenorrhœa, displacements, &c.

This wild confusion in practice—this constant recourse to severe surgical treatment and operations in women—originates, in my opinion, in the failure to recognise the facts which I laid down in the second edition of my work on Uterine Inflammation in 1848, twenty-five years ago. I therein say and now repeat: 1. That, if the os externum will admit a good sized sound, say, No. 6 or 8, it is an absurdity to divide it on any grounds; 2. That the cervical canal between the os externum and the os internum is an infundibuliform cavity, and seldom or never is contracted or requires dilatation, except in congenital cases, or in cases where there are adhesions from the action of caustics or of labour; 3. That the os internum, so far from being open, as described in anatomical works, is closed by a vital contraction of the circular fibres, like the anus, and so closed that, except in morbid conditions, force has to be used with the sound in perfectly healthy women; the exception being certain morbid conditions, and in some physiological ones, specified in my paper read at the British Medical Association.

I think the non-recognition of this anatomical and physiological fact is at the bottom of all the rash and useless surgery which I deprecate, and that I am only doing my duty in bringing the subject before the profession from my semi-retirement on the shores of the Mediterranean. Surely, as one of the Nestors, I may say, of modern gynæcology, as one who long fought the battle of uterine progress single handed, I have a right to be heard on the subject. Nor do I think that my junior friends in the gynæcological field should feel hurt if in doing so I go counter to their views and opinions. The world of science is open to all. I have fought many a hard battle with a smiling face and a hand held out to my antagonists. Moreover, we are all responsible for our opinions uttered publicly in societies, or published in the medical journals, and must stand or fall by them.

I do not enter into any further details on this important subject, for my paper is there—in the number of this Journal for September 21—to be referred to. I would only ask every gynæcologist who reads this statement to examine carefully with the sound every case of uterine or vaginal disease, slight or severe, that he sees; and, with the exceptions named in my memoir, he will surely find that the sound stops at one inch and a half from the external os, the entire depth of the uterine cavities being two inches and half. This is the depth at which the sound should pass—two and a half inches—if it enter the uterine cavity, passing the os internum.

When we consider that every healthy woman examined with the sound—if I am right, and if it stop physiologically at the os internum—must be considered to suffer from a morbid contraction by those who are unacquainted with the fact, it becomes evident at once to what a frightful excuse for useless surgery such ignorance leads. Every healthy woman in the kingdom examined under this impression may be pronounced to have contraction, and be dilated or incised, according to the mode of practice adopted.

When we consider, too, that, according to the census, half a million of married women are sterile (one in six), we see to what such ignorance must lead. The existence of the natural sphincter in this half million of women justifies, in those who ignore it, any wild fancy, any amount of dilatation or of division.—*Brit. Med. Jour., Dec.* 21, 1872, *and Feb.* 22, 1873, *pp.* 681, 196.

82.—ON THE TREATMENT OF PROLAPSUS UTERI.

By Dr. Charles R. Drysdale, Physician to the Metropolitan Free Hospital, London, and to the North London Hospital for Consumption and Diseases of the Chest.

As to the treatment of prolapse, or procidentia of the womb, some practitioners are much in favour of operations and of instrumental interference, whilst others are of an opposite opinion and dislike any active interference. In cases where there is subinvolution of the uterus after confinement, it is the best treatment to confine the patient to her couch for a time, and then try to lessen the weight of the uterus; whilst in cases where there is rupture of the perineum, the uterus being of normal bulk, supports are clearly indicated. In all cases of inflammation and enlargement of the organs again we must endeavour to treat the disease before having recourse to any other surgical procedure. Leeches to the uterus or other means advised for the treatment of uterine catarrh should be had recourse to, and all pessaries should be avoided, for a time at least. In all cases of procidentia, however, or in old cases of prolapse, when the uterus is healthy, or in ruptured perineum, or when great suffering results from prolapse, we must try the effect of supports; again, when the bladder or rectum are much prolapsed. Nothing is of more importance than the choice of a pessary or internal support in the treatment of any form of prolapse of the uterus. The air-ball pessary of Gaziel, or the air-ring are often useful. Zwanke's pessary has been much praised; but the author confesses to disliking it for many reasons. Hodge's horse-shoe pessary is useful, but in the author's opinion, the simple ring-pessaries introduced by Dr. Graily Hewitt are by far the best ever brought into practice. Hewitt's ring-pessary is merely a copper wire ring coated externally with gutta-percha and of various diameters, which can be moulded into any shape the practitioner pleases, thus being suitable for all cases of anteversion, retroversion, and prolapse. Sponge pessaries should never be used. They become rapidly most horribly fœtid. As to stem-pessaries they are all difficult to manage, and expensive, and the author cannot recommend any of them. Ashburner's pad is an admirable support in cases of rupture of the perineum and procidentia. The most important purpose served by all pessaries, which prove of any service, is to keep the uterus motionless. Pessaries, if worn at all, should not remain more than a week at a time in the vagina, since ulceration of the vagina may occasionally be the result of the long stay of any instrument; and, another point is, that the very smallest size of pessary that will keep the uterus up should alone be used. In procidentia the parts should, as soon as possible, be returned into the pelvic cavity, and retained there by an Ashburner's pad, if the procidentia is of recent date, whilst the patient is kept in bed for some weeks if possible. A few leeches may be useful to relieve the congested state of the organ prolapsed for some time. By attention to such wholesome rules, we may often succeed in causing the prolapse to cease, although the result is uncertain, especially when the prolapse has existed for a long time.

Several operations have been proposed for the radical cure of uterine prolapse. Fricke, of Hamburgh, about the year 1833, proposed to narrow the entrance to the vagina by partially obliterating the vulva, although the operation for ruptured perineum had been performed long before that time. The restoration of the perineum to its natural dimensions constitutes a most valuable operation when it succeeds. Unfortunately, it is by no means easy to ensure success, and in many of the cases which the author has had experience of, a complete failure has resulted, the patient being left in a worse state than she was previously. Fricke excised a portion of the lips of the vulva of about two fingers in breadth. The incisions commenced about an inch below the superior commissary and were united an inch behind the fourchette. When the bleeding ceased the borders of the incised vulva were united by sutures, ten or twelve of which were required. This operation sometimes succeeds well in elderly women, but it too frequently fails completely in its object. Mr. B. Brown, of London, in his operation, leaves the skin intact; merely removing the mucous membrane from the internal aspect of the labia from the urethra as far as the fourchette, and then unites the parts by sutures. This operation, like Fricke's, in rare cases is successful, but generally fails; so that repose in bed, together with well contrived supports, in fact, usually does more for the patient than either of these operations. Mr. Marion Sims, and other surgeons, advise the narrowing of the vagina by removing bands of the mucous membrane by the knife, or by cautery, which leaves broad contractile scars. The author has certainly seen several very favourable results from the first of these operative procedures. Even here, however, the rule is, that failure results, the exception that the operation succeeds. The permanent cure then of uterine prolapse is very rarely obtained. Dr. West is much in favour of Zwanke's pessary; but the author cannot say that his experience corroborates that of that most eminent obstetric physician. In these heroic days of surgery, Huguiér's proposals to cure uterine prolapse by means of ablation of the vaginal portion of the cervix have met with some favour. The author regards such operations as almost, if not quite unjustifiable, as the operation is a very dangerous one, and far too grave to be made use of for a disease which may be treated with so much success by palliative and innocent means.—*Medical Press and Circular, Oct.* 23, 1872, *p.* 346.

83.—THE TREATMENT OF PROLAPSUS UTERI WITHOUT MECHANICAL MEANS.

Nicolai Andreef, of Kasan, states that he remarked that in some cases of disease of the uterus the application of tincture of iodine restored the relaxed and weakened ligaments to a nearly normal state. In consequence of this observation he determined to try its action in cases of complete descent and prolapse of the uterus. The first trials gave such favourable results that he was led to investigate its action systematically, and his results have proved so satisfactory that he now publishes them in the hope of inducing others to give the results of their experience with it. The following is one of his cases:—In August, 1871, a patient who had suffered for four years from complete prolapsus uteri came under his care. She had tried numerous mechanical means for obtaining relief, without advantage. He prevailed upon her to submit herself to his treatment, and in four weeks he dismissed her cured. She was twenty-two years of age, emaciated, and of weak constitution. The prolapse had followed the birth of a child four years previously. The descent of the uterus was so easy that when replaced a strong cough brought it down to nearly its whole extent. The treatment pursued consisted in replacing the uterus whilst the woman was in a recumbent position. Then, with the aid of the speculum, the fold of the vagina, that is to say, the part surrounding the os, was painted with half a drachm of a tincture composed of one part of tincture of iodine and one part of alcohol. He diluted the officinal tincture of iodine because the undiluted tincture sometimes sets up acute catarrh of the vagina and even of the uterus; as he had had an opportunity of observing previously. After the application of the tincture the patient remained for three days in bed, and had an injection four times a day of pure spring water at a temperature of 20° R. The painting was then re-applied and the douches repeated. After a repetition of this plan of treatment four times the patient found herself well, and was dismissed. Four months subsequently she was pregnant and quite healthy; no descent of the uterus had occurred. He gives the details of other cases in which the prolapse was both complete and incomplete. His experience has taught him that the best results are obtained when the following conditions exist:—1. The uterus must be capable of being replaced in position. 2. Before the iodine plan is adopted all other diseases and lesions of the vagina or uterus, such as erosions, ulcerations, &c., must as far as possible be removed, otherwise inflammatory reaction is apt to take place. 3. It is only requisite to paint the vault of the vagina, and at the commencement of the treatment, with dilute solutions and weak doses. Subsequently, however, stronger solutions may be employed. Cold vaginal douches must always be used after the application of the iodine with a view of preventing inflammation of the uterus and vagina. 4. In the majority of instances it is not requisite for the patient to remain in bed after the first two applications. After ten days she may be allowed to return to her work if not of too severe a character. 5. It is important that the bowels should be thoroughly cleared. 6. The interval between two successive paintings should not be less than three days; also, with the object of preventing irritation of the vagina and uterus, the cold douches may be continued for some time after the last application of the iodine. When the cure is complete, the vagina does not become narrower, but it is thicker than it was before. After reposition of the uterus, some sympathetic disorders of the stomach often occur, but this is easily remedied.—*Virchow's Archiv; Practitioner, Nov.*, 1872, *p.* 305.

84.—ON REDUCTION OF THE UTERUS IN CHRONIC INVERSION.

By Dr. Robert Barnes, Obstetric Physician to St. Thomas's Hospital.

[Sarah C. was suffering from hemorrhage a month after labour, at which it was probable that a certain amount of inversion of the uterus had occurred but had been reduced, as it turned out however only temporarily. A tumour of the size of a hen's egg was felt in the vagina, connected by a neck narrower than the body of the tumour to the os uteri. The tumour was sensitive. The tip of a sound passed into the bladder and curved backwards could be felt by the index finger of the left hand in the rectum, showing the absence of the uterus from its natural position.]

On the 14th November a caoutchouc bag was placed in the vagina and kept distended with water. This was kept up during five days. Twice I tried to reduce by taxis under chloroform. The taxis was performed by passing the left hand within the vagina, grasping the circumference of the tumour and trying to squeeze it through the ring of the os, whilst the tips of the fingers of the right hand pressed down through the abdominal wall, dipped into the funnel formed by the inverted uterus, and gave a counter-pressure and support to the hand inside.

This failing, and the patient being too much prostrated to justify further delay, I determined to make one more effort to reduce the uterus by the aid of a plan which I have advocated in my lectures for the last twenty years, and which has been also suggested by Huguier, Simpson, Sims, and others. This consists in incising the os uteri at two or three points of its circumference, so as to relax or weaken the constriction formed by the circular fibres of the cervix before applying the taxis.

This I accordingly did on the 23rd November. I drew down the uterus outside the vulva by means of a sling of tape passed round its body. The neck being on the stretch, I made three longitudinal incisions into it, one on each side and one behind. The incisions were about a third of an inch deep and two-thirds of an inch long. I then passed the uterus back into the vagina and proceeded to re-invert. I was surprised to find how readily the uterus went through the os; but I was not a little uneasy at feeling that uterine tissue gave way, as if the incisions were extended by laceration. No bad symptoms, however, followed; and there was little hemorrhage. Eighteen days after the operation she had rigour and tenderness in the abdomen; but she recovered completely. On the 23rd December I made the first examination. The uterus was *in situ;* the os has a transverse fissure: all seemed to be in healthy condition. Some days later I introduced the sound. By this it was ascertained that the cavity of the uterus was somewhat shorter than normal. This I had observed by the finger at the time of reducing. It seemed as if the fundus uteri squatted down a little.

I have since heard from Mr. Bell of Rochester that the subject of this operation became pregnant some months afterwards, and had a successful labour without tendency to recurrence of the inversion.

In the second case I carried out the modifications which reflection upon my first case had suggested. Failing with simple pressure, I made a shallow incision on either side of the os uteri, omitting the third incision behind; then, instead of resorting immediately to taxis, I reapplied the elastic pressure, and tried taxis gently at intervals. The gradual gentle action is safer from the risk of laceration. I also swabbed the interior of the uterus after restoration with a solution of perchloride of iron. This is a security against hemorrhage, and by promoting contraction or corrugation of the tissues is a security against the re-occurrence of the inversion.

These two cases seem to me to be valuable in extending the power of sustained elastic pressure in reducing chronic inversion of the uterus. One drawback experienced during the application of sustained pressure is the time during which it is commonly necessary to keep it up, during which the patient must endure pain and run the risk of irritation and inflammation. It becomes a matter of great moment to shorten this period, the more so because when treatment is necessary the subject will often be so reduced by hemorrhage that she might sink before the reduction is accomplished. The plan I have practised effects what is wanted.

The repeated success which has attended it justifies me in affirming with even more confidence what I said in the memoir referred to—namely, that ablation of the uterus is not justified until after reduction by elastic pressure has been steadily tried; and that when elastic pressure has failed, there is still another resource that stands before amputation, that is, the incision of the cervix uteri.

Firmly convinced of this, I do not think it necessary to describe or to discuss at length the various methods of amputating the uterus, or effecting forcible reduction, as by Professor White's method, or by making an abdominal section through which to introduce a dilating instrument directly into the funnel of the inverted uterus from above, as devised and practised by Professor Thomas.

The forcible reduction has been attended, as might be expected, by disastrous results, the uterus having been torn from the vagina; and a method of dilatation which requires gastrotomy to carry it out must inevitably be attended with serious danger.

The case appears to be eminently one in which the moral of one of La Fontaine's fables applies:—"Plus fait douceur que violence." The sustained gentle pressure of the elastic pessary, aided if necessary by slight incisions, will not only overcome the resistance more surely, but also with greater safety.

In trying elastic pressure I found some inconvenience in the adaptation of elastic bags. These, when distended, stretch the whole vagina excessively, and require a firm point d'appui in the perineum, which cannot always be had. They may also fail to exert pressure upon the fundus where it merges into the inverted cervix uteri so directly as might be desired. I therefore in the second case had a special instrument constructed on the model of the stem-pessary. The stem, suitably curved, is surmounted by a hollowed cap of caoutchouc, upon which the inverted fundus of the uterus rests. To the lower end of the stem are attached strong elastic tubular bands, two of which are brought up in front and two behind, to be made fast to a belt round the abdomen. By bracing up the posterior bands, a forward direction is given to the elastic cap, so that the uterus is pressed up steadily upon the fundus of the vagina, constantly tending to distend this particular part, and thus to pull open the cervix uteri. I found the instrument to answer so well that I describe it here. It is more convenient than bags, because by loosening the anterior straps ease can be given to empty the bladder, without removing the instrument; and the straps permit of ready and accurate graduation and direction of pressure, due elasticity being preserved.

The preceding histories show how nearly I fell into the error of amputating the uterus, mistaking it for a polypus. The annals of medicine record several instances where amputation has thus been carried out. Dubois relates several. Yet the means of distinguishing the two affections are entirely satisfactory. Nothing in diagnosis is capable of more precise demonstration. But inversion is so rare, and polypus comparatively so common, that the mind, preoccupied with the more common event, easily loses sight of that one which is rare. It will not therefore be superfluous if I take the opportunity of indicating the means of avoiding the error of treating an inverted uterus as if it were a polypus. I will only mention three rules.

1. Many observers bear testimony to the fact that the sensitiveness of the inverted uterus is not to be trusted to as a diagnostic sign. In many cases no pain is complained of when the body of the uterus is handled. But the case is very different when compression is applied to the neck of the tumour. The round ligaments and the Fallopian tubes are compressed, and agony, inducing prostration, is the immediate result. This is truly diagnostic, and it may be turned to account without the dangerous test of the ligature by squeezing the neck between the finger and thumb.

2. Before noosing a presumed polypus, if the sound cannot be passed two inches or more beyond the os uteri, where it embraces the neck of the tumour, the sound should be passed into the bladder, and its point felt for by the finger in the rectum above the tumour.

3. Never induce anæsthesia for the removal of a polypus. If the ligature be tightened round a polypus it gives no pain; but if it be tightened round the uterus, the pain produced gives warning and the opportunity of retrieving error at the last moment.—*Obstetrical Journal, April*, 1873, *p.* 1.

85.—TWO CASES OF LARGE FIBROID TUMOUR OF THE UTERUS SUCCESSFULLY TREATED BY ENUCLEATION.

By William Ross Jordan, Esq., Surgeon to the Birmingham and Midland Hospital for Women.

The cases which follow are two of the most interesting cases of fibroid tumour of the uterus that I have treated in the Hospital for Women, both the tumours being in the wall of the uterus, and having no tendency to point into the cavity. The treatment was similar in some respects to that recently recommended by Dr. Meadows, but seems to have been much more expeditious in its results; whilst another case, still under treatment, is progressing very slowly.

Case 1.—Mary Jane B., aged twenty-four, single, small and sickly-looking—in fact, presenting a striking picture of exsanguine emaciation, not being able to walk into the room without help. She came to the Hospital for Women on the 12th of September as an out-patient, complaining of very frequent and profuse hemorrhage. On examination, she was found to have a large fibroid tumour in the anterior wall of the uterus, which could be easily felt through the wasted walls of the abdomen. The uterine cavity measured four inches. The general condition of the patient demanded immediate attention, and I proposed to take her into the hospital; however, she preferred to take physic for a time, and try its effect. The following week she was much the same, and elected to come in; but, as we had then no room, she was not admitted until the 24th. She was allowed a few days' rest in bed previous to the commencement of active treatment.

On Sept. 28th an ordinary-sized tangle tent was introduced into the cervix, which unfortunately was not retained, and was followed by considerable hemorrhage. A few days' further rest was given to allow any irritation from the first tent to subside; and on the 3rd of October another tent was introduced, which remained in position, and caused very little loss of blood. Next day the tangle tent was removed, and followed by a large sponge tent. On the 5th the cervix and cavity were sufficiently dilated to admit of a free investigation. The result was that the first diagnosis was confirmed, a large tumour being found in the anterior wall of the uterus, and not presenting any marked projection into the cavity.

Oct. 5th. An incision was made into the lowest and most prominent part of the tumour with a guarded bistoury, about half an inch deep. The cervix in a line with the incision was divided with a pair of strong scissors. For a few days she went on very comfortably, without hemorrhage, and with very little pain, the tumour showing no disposition to extrude.

9th. Going on well; feeling better; an offensive watery discharge has come on.

About this time I went from home for a fortnight. The notes of the case on the hospital paper (made by Dr. Louisa Atkins, resident medical officer, who also had charge of the patient, and to whose care and attention in this and other cases much of my success has been due), show that a very offensive discharge was present, and considerable pain, at times very severe, and that she suffered from symptoms of pyæmia, the temperature being on one day as high as 39·8° C., and for a week or ten days varying between 37·5° and 38·5°. I returned home on the 24th, and found the note of the morning state, "hemorrhage, not profuse; pain; offensive discharge continues." Before the next note was made I saw the patient, who said that the pain had become worse than usual about four in the morning, and that it had increased in severity till eleven, when, with very violent pain, something came into the passage. Judging from her description of the pain, it was very like the pain of labour. A superficial examination showed a large, rounded mass, filling the cavity of the vagina. As she complained of great tenderness on examination, and was full of fear, chloroform was administered, and a large fibroid, about six inches long by three, was found perfectly free in the vagina, and removed without difficulty.

25th. Going on well; appetite good. Has slept well. Temperature in the morning normal; in the evening one-fifth higher. The temperature had been nearly normal in the morning for the last three days, but in the evening had gone up to 38°.

31st. Doing well; discharge nearly gone. The uterus has resumed its natural size and mobility.

A month later the patient came as an out-patient. She was scarcely recognized, so much improvement having taken place in her general appearance. She is stout, and has a good colour.

Case 2.—Mrs. S., aged forty six, married, has had five children, the last twelve years since. Has been under treatment for some time for a hard swelling in the abdomen; suffers from great and frequent hemorrhage, and is in a state of great exhaustion. Examination of the abdomen showed a hard, irregularly rounded tumour, reaching from the pelvis to the umbilicus, four or five inches from side to side. Vaginal examination showed the os and cervix large, the latter swelling out after the manner of a pregnant uterus, movable; sound, six inches and a half by a circuitous route, and in front of a solid mass, could be easily felt below and to the right of umbilicus—in fact, so easily as at first to cause some doubt as to whether it were still in the uterus.

The same plan of treatment was adopted as in the last case—viz., two large and long tangle tents were introduced. On the next day it was found that one of them had slipped into the cervix, so that the os was only dilated by one, whilst the cavity was expanded to the size of both. They were removed, and a large sponge-tent put in their place. On the following day the sponge was removed, the smell being very disagreeable. There was now sufficient room to introduce two fingers into the cervix and to find a large tumour in the posterior and left wall of the uterus.

Feb. 8th. An incision was made about two inches long on the lowest and most prominent part of the posterior wall, the cervix being divided in the same line by scissors. On passing the finger into the wound and separating the tissues between the mucous wall and the tumour about an inch each way, a soft roundish mass distended the wound. There was little hemorrhage. On the next day (the 9th) the mass had filled the opening of the wound, but did not project; on the second day (10th) the tumour projected into the vagina about the size of an egg; the third day (11th), at eleven a.m., the tumour was as large as a small fist, and nearly filled the vagina. Finding that it was still firmly fixed above, and that it was so soft that the vulsellum forceps tore their way out of it if much traction were made, ergot was given every three or four hours, and at seven p.m. the tumour was attacked with the intention of removing all if possible, if not, part, as it was getting offensive. After half an hour's tugging and coaxing, a tumour weighing twenty-seven ounces was removed; the uterus was injected with a solution of Condy, and on examination an irregular but flat mass was still felt in the cavity. This not being large, and probably being the irregularly-contracted mucous wall which had covered the anterior aspect of the tumour, was allowed to remain to contract and subside into its natural place, if part of the uterus, or to be expelled if part of the tumour; but as the upper portion of the tumour, or that part which was last delivered, was most entire and perfect, it was left with a strong notion that it would stay.

Ergot was given for several days to aid contraction and prevent hemorrhage. Patient went on favourably and left the hospital on March 10th, comparatively well, but still weak.

These reports show that there are many cases commonly regarded as hopeless which may be cured, and in which no great harm can be done. The treatment is simple, and although some surgeons may consider it too heroic, very little harm can follow if care be taken to keep the incision over the bulk of the tumour, and if the fingers are not too vigorously employed to separate the capsule. Should this treatment not finally expel the tumour, it would probably relieve the hemorrhage for a considerable time.—*Lancet, March* 29, 1873, *p.* 442.

86.—ON THE CAUSATION OF ACQUIRED FLEXIONS OF THE UTERUS AND THEIR PATHOLOGY.

By Dr. Squarey.

The author's object in this paper (read before the Obstetrical Society of London) was to explain why, in two cases, the same causes and conditions apparently existing, an anteflexion is found in the one case, a retroflexion in the other. Having shortly noticed the anatomical relations of the uterus, the author called special attention to the rising and falling of the uterus in the pelvis in different positions of the body, and to the alteration in the direction of the axis as it so rose and fell, pointing out that in whatever plane of the pelvis the uterus might be situated, its axis was invariably at right angles to that plane; and he showed, referring to drawings, that the axis of the uterus varied considerably in these different positions, looking when low down almost in an opposite direction to what it did when high up; and, consequently, that the direction the fundus uteri took in a flexion depended entirely on the situation of the uterus in the pelvis at the time that the cause producing it came into action. Thus, when an anteflexion is produced, the uterus is situated high up in the pelvis, occupying its normal position, the axis being forward, so that any force striking it from above would impinge on the posterior and upper surface of the fundus, and so force it forward and produce anteflexion; that when a retroflexion is produced the uterus has from some cause sunk more or less deeply in the pelvis, and has its axis diverted more or less backward, so that any force striking it from above, would impinge on the anterior and upper surface of the fundus. As a proof of the correctness of this view, reference was made to the predisposing and exciting causes of flexion, as described by Dr. Graily Hewitt. Anteflexion is found to be much more common in young adults and in the virgin state, while retroflexion is much more common in older women and in women who have borne children. Again, when retroflexion exists in virgins there is almost invariably a history of depressed general health, and there exists relaxation of all the tissues. In speaking of the pathology of flexions, he specially referred to those cases in which a sudden strain causes a flexion. What, in such cases, keeps the uterus in its flexed position? When retroflexed, the pressure of the intestine explains it; but this does not apply to anteflexion. The author believed it to be due to loss of tone of the uterine tissue; the loss of tone being due to some bruising of the uterine fibre, with some slight effusion of blood into its tissue.—*Lancet, Dec.* 28, 1872, *p.* 916.

87.—ON FIBROID DEGENERATION OF THE UTERUS AND THE BEST WAY OF TREATING IT.

By Dr. Protheroe Smith, Physician to the London Hospital for Women.

There is, perhaps, no pathological condition which has received greater attention of late years from gynæcologists than that known as fibroid disease of the uterus. Although generally recognised as forming numerically by far the largest portion of the morbid affections of the organ, fibroids of the uterine tissue present great varieties of situation, form, and relation to adjacent organs, and consequently the attendant physical signs and symptoms are proportionately manifold. This has probably led to the contrariety of opinion and difference of treatment which obstetric physicians have advocated.

The disease is found intimately associated, and sometimes as it were intermingled, with the normal contractile tissue, which makes up the bulk of the organ in contradistinction to the soft tissue lining the uterus, and which gives rise to that vascular growth known as mucous polypus. While thus intercurrent with the contractile fibre-cells, the attendant symptoms, both local and general, may be explained by the irritation which is created, inducing a constant though generally ineffective effort on the part of the uterine contractile fibres to expel the offending matter. When such an effort is successful, the mass is either projected into the uterine cavity, covered only by the lining membrane, and becomes polypoid, when it is easily removed by ligature, *écraseur*, or scissors; or, if thrust through the contractile tissue, it is expelled outwardly, or, if formed by deposit in the cellular tissue directly beneath the peritoneum, it becomes a subperitoneal fibroid, where it only annoys by the effect of its bulk and weight on adjacent organs, when it can only be removed, if pedunculated, by an abdominal section, or, when implicating the uterine structure, by the extirpation of the whole of the uterus and appendages—an operation unjustifiable excepting in extreme cases, fraught as it is with much peril to life. When the disease is distinct from the normal structure, but sessile in form, it may often be successfully treated by incising and dilating the cervix and enucleating the mass, by removing it piecemeal with ligature or *écraseur*, &c.—a plan of treatment which I have adopted with complete success in several cases extending over a period of seven years.

In instances in which excessive hemorrhage demanded it, and in which enucleation was impracticable, I have found incising the mass, with the uterine tissue embracing it, especially the cervical portion, productive of the happiest results. In some long standing cases, with flexion or retroversion of the fundus, continuous pressure, by means of a fixed intrauterine support, has been followed by reduction in bulk, and in some instances even by the entire disappearance of the tumour. Acting on this suggestion, and seeing that every natural cure, by polypus and exfoliation, was the result of contractile efforts, I have endeavoured, when beyond the aid of surgery, to treat these diseases by helping forward, medicinally or mechanically, the natural efforts for their cure, viz., that of compression and expulsion; the former, compression, diminishing the vascularity of the primary albuginous or sarcomatous state, and converting it into inert fibro-cartilaginous, cretaceous, or osseous matter, thus effecting that change in the disease from a soft erectile, easily congested or inflamed, and growing or active tissue, into that dense and more compact and less organised structure which is not so capable of congestion and inflammation. This condition constitutes its passive form, usually observed after the cessation of menstruation, when (following years of suffering, the consequences of uterine irritation, inducing hemorrhages and sympathetic or reflex pains and distress) a state of good health often follows, interrupted only, as far as the fibroid is concerned, when by mechanical irritation it incommodes adjacent organs. Of all the means of relieving such secondary annoyances, parietal support is the most eligible, to procure which, the "pelvic band" is by far the most effective means. Medicinally, ergot of rye with borax, the application of cold externally, by compress or otherwise, and *per vaginam* by douche, with mineral acids and astringents, the recumbent posture, the pelvis being kept above the level of the heart, and a high and dry situation, will be found amongst the most effective remedies. To aid expulsion there is nothing like ergot of rye and borax, taken in doses of from fifteen grains to thirty of the former to five of the latter. When enucleation of a large mass is attempted, the most dependent portion should be removed as soon as possible after it becomes detached from the uterine wall. This is most important, as, if it be left till the greater portion has become loosened from its attachments, there is danger of disintegration of the loosened tissue, and of consequent blood-poisoning.

To accomplish the enucleation of a large intramural fibroid, the cervix uteri, when it is required to expose the disease, should be incised laterally throughout its entire length on both sides; after which it is easily dilated by sponge-tents, and by the fingers or hand, and the swelling may then be gradually peeled off from the walls of the uterus by repeated efforts, as the patient is able to bear it—always removing, by ligature or otherwise, from time to time, such portions of the disease, as may come within reach. To do so, I prefer, as a rule, the ligature applied by Gooch's canula to the *écraseur*, because during the process of separation there is always an attempt on the part of the womb to expel the disease, and at the same time to keep dilated and open the os tincæ and cervix, thereby rendering future operations more easy than when the piece is at once cut off and the remainder retires within the embrace of the uterus. When the chief bulk of the disease has been removed, the remaining portion is usually absorbed, and the cure is completed, as shown in the case above quoted.

Passing by the consideration of recurrent and fibrocystic disease, I would call attention to fibroid degeneration of the cervical portion of the uterus. This perhaps is, if not the most frequent, a very common form of the disease —often, I believe, mistaken for *élongement*, or utero-cervical areolar hyperplasia, simple induration, and even for carcinoma. The microscope, and a more attentive investigation of the subject, will, I think, confirm the conclusions to which observations extending over a period of thirty years now enable me to make the following brief and concluding remarks.

There is scarcely any condition of the uterus which is accompanied by more distressing symptoms and disorders than that under consideration. It may be shortly described as presenting usually an increase both in bulk and length of the cervix uteri, which becomes much firmer and often nodulated, the nodules being generally more indurated than the surrounding tissue; the os is patulous, and one or both labia are everted, and the lining membrane congested, inflamed, and granular. With the speculum, the labia are in its early development seen to be injected, becoming afterwards, however, often pale and exsanguineous. The disease usually commences in the labial portion of the cervix, and subsequently implicates the deeper structures, extending at times throughout the whole length of the cervix, and in some instances is continuous with similar degenerations in the body and fundus; when so, there is usually considerable deformity, resulting from flexion and torsion of the organ.

The symptoms may be briefly described as rectal, vaginal, or vesical pains and irritation, bearing down, thick mucous leucorrhœa, weariness and aching in lumbar and sacral regions, and in the hips and thighs, with lameness of one leg, sympathetic pains in the dorsal region and scrobiculus cordis, nausea, and other dyspeptic derangements, with various nervous and hysterical affections. No general treatment that I am aware of gives permanent relief to this distressing malady. The entire removal, however, when practicable, of the diseased structure proves the truth of the foregoing pathological description, by the complete relief to the symptoms which usually follows the means which I here advocate for the cure of the disease.

When simply labial, it may be amputated by means of the *écraseur*, or destroyed by the actual cautery or bromine; but I prefer and always employ potassa caustica for this purpose, whether the affection be superficial or deep-seated, for the following reasons.

It may be used with perfect impunity, and it gives comparatively little pain. It may be employed with such accuracy and precision as nothing but the scalpel otherwise can afford; and, when proper caution is observed, it leaves no injurious consequences behind, as puckering and contractions of the adjacent vagina, &c.

It is impossible here to do more than very concisely to mention the *modus operandi* of this remedy and its results. By means of my expanding cylindrical speculum, the patient lying on her left side, I procure not only a more extensive view of the uterus than by other means, but the upper part only of the vagina being thereby expanded, a basin is, as it were, formed edgeways, which is filled with vinegar and water up to the exact line, as far as that on which you intend to operate, with the potassa caustica. In doing so, all risk of injury, by the melting and *débris* of the caustic, is obviated.

When the disease is of long standing and very hard, after one or two applications of the potassa caustica, its character is obvious. Contrasted with the surrounding red normal tissue, it is distinctly seen to be of a white color (like that of white India-rubber or the fat of beef); relief from pain is often immediately felt after separation of the first slough, and this is, I believe, owing to the removal of the tissue investing the disease, which beforehand prevented it from being expelled, by the fruitless contractions which its presence usually provokes. On the contrary, it will be seen, after each application of the potassa, that the white fibrous matter rubbed down to a hollow by the caustic, becomes in three or four days a projection, and thus, however deeply implicating the cervix, the whole is gradually thrust forward so as to be brought under the solvent action of the potassa till the whole is enucleated. When no remaining disease can be felt, it only remains to pass a large-sized bougie daily to the extent of the wound to prevent cohesion of its sides whilst healing.

From amongst a mass of cases, I must content myself by enumerating some of the favourable results I have seen from such treatment: speedy and entire relief from pains, lameness, in a word the symptoms already mentioned as indicating the disease, followed, in several instances, by pregnancy and healthy labours. In illustration of the subject, I would conclude by quoting the following case recently treated by me in the Hospital for Women. I do so the more readily, because it was taken by Dr. Snow Beck, who had, previously to treatment, demonstrated microscopically the fibroid character of the disease, although the extreme fœtor of the discharges, and the severity of the pains, and the sallow and distressed aspect of the patient had suggested the possibility of cancer. It will be remarked that, by acting in accordance with this view of the pathology of the case, notwithstanding the difficulty and extreme caution required in using so powerful an escharotic at such a depth, a perfect cure resulted, the patient continuing entirely free from the pains, headaches, and other distresses which had made her life for so long almost insupportable.

M. H. T., aged 45, married twenty-four years, was admitted May 15th, 1872. She had had twelve children, the youngest seven years ago. She had children quickly. Nine years ago she saw me on account of leucorrhœa. She had leeches applied occasionally. On admission, the lips of the uterus were very tender on pressure, with an induration in the cervix, giving almost the feeling of carcinoma, together with an offensive discharge. Potassa caustica was applied to the lips and neck of the uterus about twice a week for about eighteen times. Ergot was administered, and as the growth was rubbed down, the uterus pushed the fibroid growth forward. The result was complete removal of all fibroid deposit with entire relief from pain, leaving a small round os uteri with normal tissue around it.—*British Medical Journal, Dec.* 28, 1872, *p.* 713.

88.—ON INTRA-UTERINE MEDICATION IN THE TREATMENT OF CHRONIC UTERINE CATARRH.

By Dr. W. S. Playfair, Professor of Obstetric Medicine at King's College, and Physician to the Hospital; Examiner in Midwifery and the Diseases of Women to the Royal College of Physicians.

The superficial erosions and abrasions caused by the removal of the epithelium from the surface of that part of the womb, dignified by the high-sounding name of ulceration, were formerly so readily observed through the speculum that far too much attention came to be paid to what is, after all, a comparatively unimportant symptom; and it must be admitted that the speculum and stick of nitrate of silver came to be used or abused in a manner which is much to be deplored. Nothing in Dr. Bennet's work justified the errors into which his over-zealous disciples fell, but the fact that the errors were committed is none the less certain.

Then came reaction, and we have it on the authority of one of our most eminent physicians that "ulceration of the womb, which was once so common, has now given way to displacements;"* and the statement represents what I believe to be a fact, that the same exaggerated attention which was once given to mere superficial changes in the cervix is now paid to alterations in the axis of the womb, which, like them, I hold to be, in a large proportion of cases, of a merely secondary nature.

It would be impossible for me, in the short space of time I have at my disposal, to enter at any length into the pathology of the conditions which may render intra-uterine medication admissible, since I propose, in these lectures, rather to direct your attention to the methods of applying it, which are not discussed in any of our English works, and to meeting certain of the current objections which are most commonly brought forward against it. But I am anxious not to incur the imputation of advocating a routine treatment; and I must say one word as to the class of cases in which it is employed. These are of the kind which have been variously described as "chronic uterine catarrh," "endo-cervicitis," "endo-metritis," "uterine leucorrhœa." The precise nature of many of these is no doubt complex. The chief and most prominent symptom observed on examination is a profuse, glairy, tenacious discharge, like the white of an egg, pouring out from the os uteri; and accompanying this, we very generally, but not necessarily, observe a varying amount of abrasion of the cervix, depending essentially on the epithelium being stripped off the villi covering its mucous membrane, which, in old-standing cases, become markedly granular and hypertrophied, having a florid red appearance, and bleeding on being roughly wiped. These changes upon the exterior of the cervix unquestionably depend on and are connected with a similar morbid state of the mucous membrane lining the cavity of the cervix and the body of the uterus; and it is just because the cure of these easily observed external changes is of comparatively small and merely temporary value that it is necessary to resort to intra-uterine medication. But it is very rarely that these are the only symptoms. Most frequently there is also marked change in the body of the uterus; engorgement and hypertrophy from plastic exudation into the substance of the uterine walls and neck; often enough, but by no means universally or even generally, concomitant flexions from the falling forwards or backwards of the over-weighted uterus. All these morbid states are to be traced to inflammatory or congestive conditions, arising in many cases insidiously, and traceable very frequently to changes in the uterus connected with pregnancy, too often neglected in their early stages until they have thoroughly undermined the health of the patient. To direct the attention solely to the profuse catarrhal discharge of the uterus, of which it is so prominent a symptom, would, therefore, be a great mistake; and in arranging a suitable treatment for cases of this kind we should be careful not to take too narrow and one-sided a view of them. But it can hardly, I think, be questioned that the mucous membrane lining the deeper-seated parts of the generative tract is in itself usually in a very morbid state whenever a large quantity of discharge is secreted from it, and that it is hopeless to expect a complete cure of the patient's sufferings unless this is modified by such topical applications as we would undoubtedly use in similar states of the mucous membrane in other parts of the body. How common it is for us to see patients who have for years been in a state of chronic invalidism; who have been from one hospital to another; who have taken pints of strengthening medicine; who have been kept for months in the recumbent posture; who have been leeched, scarified, and blistered; who have suffered from all those anomalous reflex disorders so common in old-standing uterine disease; and who may have got some temporary, but no lasting, benefit from all the treatment they have undergone.

You may consider this an exaggerated picture, and no doubt it is only applicable to the worst class of cases. That it is not, however, an untrue one of them you may believe on the testimony of so eminent an authority as Scanzoni, who says: "We may esteem ourselves fortunate if we can but moderate the hypersecretion of the mucous membrane, and moderate its consequences. As for ourselves we do not remember a single case where we have been able to cure an abundant uterine leucorrhœa of several years' standing. Many women whom we have been called upon to treat, had to attribute to a neglect of the disease a bodily and mental debility which they would keep for the rest of their days, or hysterical attacks which deprived them of all enjoyment for life."

If you bear in mind the complex structure of the mucous membrane, you will readily understand how important it must be that it should be in a natural and healthy state. For in addition to the peculiar penniform rugæ lining the cervix, we have the villi of the uterine neck and the innumerable glandular mucous ducts which cover the entire lining membrane of the cervix and body of the uterus. The question has been hotly contested whether, in chronic leucorrhœal discharges escaping from the os, it is the lining membrane of the cervix or body of the uterus that is most at fault. Interesting as the question may be from a pathological point of view, it seems to me to be of secondary clinical importance, because in any attempt to cure the morbid state of the mucous membrane our remedies must be applied equally to the whole lining membrane of the generative tract beyond the os. It is obviously impossible to limit them to any one portion of it. One point of importance should be noticed—that in all old-standing cases of chronic uterine leucorrhœa the os uteri and canal of the cervix are in a morbidly open and patulous condition, admiting the sound or uterine probe with the greatest ease, and enabling us to move it freely about the dilated cavity of the uterus. This peculiarity has been noticed by all who have written on intra-uterine treatment, which it materially facilitates; and it is remarkable that the patency of the cervical canal diminishes *pari passu* with improvement in the case. I mention it here especially because, to my mind, it effectually disproves the theory lately advanced by my friend Dr. Graily Hewitt, in the new edition of his well-known work, that chronic uterine leucorrhœa is the result of the cooping up of uterine discharge from obstruction of the uterine canal, generally the result of flexions. He maintains that previous dilatation of the cervix has come to be an essential part of intra-uterine medication, and that the beneficial result "is sufficiently explained by the dilatation, which, by straightening the canal, renders it thoroughly patent." We shall presently see, however, that such preliminary dilatation is only necessary when intra-uterine injections are used—the worst of all forms of intra-uterine treatment, and one which, I believe, should never be employed.

Let me, before proceeding to discuss the various modes of intra-uterine medication, especially insist,—

1st. That I do not recommend intra-uterine medication in a hap-hazard way whenever we meet with a case accompanied by profuse leucorrhœal discharge, but only when this is very abundant, and when it evidently comes from the deep-seated parts of the uterine canal beyond the os, from which it is seen issuing through the speculum; and even then only when the case has proved rebellious to other and simpler methods of treatment.

2nd. That I never adopt it unless I am satisfied that the uterus is likely to bear it with impunity, and that where there is much tenderness of the womb on being touched, even when the case is otherwise suitable, I deem it advisable first to remove the congested condition by rest, the application of one or two leeches, the introduction into the vagina at bedtime of pledgets of cotton wool thoroughly soaked in glycerine, as recommended by Marion Sims, the use of sedative pessaries, and other suitable means; and that the slightest evidence of any concomitant inflammatory mischief or irritation, recent or of old standing, in the neighbourhood of the uterus, as in tenderness on pressure in the region of the broad ligaments, or in fixity of the uterus in some part of its contour, is an absolute contra-indication. To careful attention to these precautions I probably owe the fact that, though I have been constantly adopting intra-uterine medication for the last four years, I am still able to say what I observed in a paper on the subject which I read at the British Medical Association at Leeds in 1869, that I have not yet met with a case in which anything but good followed its use. This is the more satisfactory, as I am quite willing to admit that this, like every other form of treatment involving mechanical manœuvres, whether in connexion with the uterus or any other part of the body, is capable of doing harm if rashly, injudiciously, or unskilfully used.

3rd. Intra-uterine medication should not interfere with any other kind of treatment, local or constitutional, which the peculiarities of the case may require. Into the details of this it is clearly impossible for me to enter at present, but it is far from my intention to undervalue it, and, indeed, no one lays greater stress on careful attention to all the usual methods of treating such cases than I do. It is only as an accessory and additional to them that I advocate that which I am specially discussing.

[Uterine injections were used by Hippocrates. They are mentioned by Paulus Ægineta, and are recommended by many of the older writers. There have however been so many unfortunate results from their use as to throw doubts upon their admissibility, at any rate as an ordinary mode of treatment.]

Hennig observed that sometimes blue ink, injected with only moderate force, found its way into the venous system of the uterus and broad ligaments without any apparent laceration having been produced, and this, he believes, may explain the cases of metritis and peritonitis that have followed their use. The evidence is overwhelming, however, that intra-uterine injections, however carefully practised, and however small in amount, are apt to be followed by very alarming, if not dangerous, symptoms. All who have used them much have met with cases of the kind. These seem to arise from intense uterine colics, resulting from the efforts of the uterus to expel fluid for which there was not sufficiently free exit through the os uteri, and the pain is described as very severe, and accompanied by grave constitutional symptoms. My predecessor, Dr. Priestley, has related to me a case in his own practice which forcibly illustrates the kind of evil to be apprehended On one occasion he injected a tion of nitrate of silver into the uterus of a patient for an obstinate uteri corrhœa, which had resisted all other treatment. This was done in his own consulting-room, and immediately after the patient was seized with violent abdominal pains, so violent that she had to be carried to a bedroom, and it was not found possible to move her until a day and a night had elapsed. The symptoms then gradually diminished, and no further ill effects followed. Courty, who is himself an ardent advocate of intra-uterine medication, tells us: "J'ai vu naitre instantanement à la suite de ces injections des accidents si formidables, que je me suis bien promis de n'y revenir jamais avec les liquides caustiques."

It has been said that if the cervix were first dilated with laminaria or sponge tents, or with graduated metallic bougies, these bad results need no longer be feared. I dare say this would be the case, since the balance of evidence is clearly in favour of their arising from mechanical distension of the uterus. But to treat effectually an old-standing case of uterine leucorrhœa we require to renew our applications at intervals for weeks or months. To suppose that, under any circumstances, it would be justifiable to repeat the dilatation of the cervix, say once a week, is an aburdity. My experience has taught me to look upon dilatation of the cervix as a formidable operation, apt to be followed, even when most carefully done, by serious inflammatory mischief, and only to be undertaken when absolutely unavoidable. If, then, dilatation is an essential preliminary to intra-uterine injection, as by common consent it seems to be, that method of treatment is at once put out of court in cases of uterine catarrh, although it may still be admissible in other conditions, such as menorrhagia, where their frequent repetition is not necessary. This is a verdict that I the more readily acquiesce in, because the same results can be obtained by simpler and equally efficacious means.

The danger of intra-uterine injection has suggested the application of various solids to the uterine mucous membrane. Sir Jas. Simpson occasionally employed for this purpose fine intra-uterine pessaries, made of some soluble material with which nitrate of silver or sulphate of copper was mixed. Dr. Braxton Hicks also uses points made of sulphate of zinc, which are passed into the cervical canal and allowed to melt there. Of these contrivances I have no personal experience, but it seems to me that it must be difficult to pass a brittle or flexible pessary of this kind into the interior of the uterus. If the pessary be sufficiently powerful in its composition to have a decided alterative effect on its mucous membrane it would seem unsafe to leave it for an indefinite time in the interior of the uterus, and if it is not sufficiently powerful it is not likely to be of much benefit.

Dr. Thomas, of New York, recommends medicated tents of sponge, of sufficient size to fit the cervix, and saturated with various alterative applications, such as nitrate of silver, tannin, or the like. He supposes that they act in two ways, partly by bringing the alterative application they are imbued with into direct contact with the mucous membrane, and partly by the pressure they impart during dilatation. The use of sponge-tents is strongly recommended by Dr. Emmett and others, as in itself of great value in certain conditions of chronic hypertrophy of the cervix, combined with a granular state of its villi. For the reasons I have already mentioned, I have always considered this expedient to be inadmissible. I believe that there are few gynæcologists who have not seen severe inflammatory attacks follow the use of sponge-tents, even when most carefully used, and I confess to never employing them without apprehension.

Various contrivances have been invented by which nitrate of silver in substance may be applied to the uterine mucous membrane, such as melting it over the extremity of a uterine sound, or passing through a stick of it a fine platinum wire, by means of which it is passed through the cervix. Another expedient of the kind is one very strongly advocated by Professor Courty of Montpellier, by which he tells us, he has never failed to cure every case of uterine catarrh, however obstinate, that he has had under treatment. It consists in passing into the cavity of the uterus a small piece of solid nitrate of silver which is allowed to remain there. The caustic gradually melts, mingles with the uterine discharge, which Courty supposes prevents any undue irritation of the parts, and gradually flows over the entire mucous membrane. Certain precautions are insisted on in using this application, principally that several days should have elapsed since the entire cessation of the menstrual period, the absence of any flexion of the uterus which might prevent escape of the discharge saturated with the melted caustic, and the absence of any marked congestion or irritation of the uterus.

Now it must be admitted that it would be difficult to imagine anything more apparently violent in its action than this. The natural objection to it is that it is a coarse mode of treatment, and one of which we cannot control the action. In addition to this there seems to be some risk of producing induration and contraction of the cervical canal, a result which has been said to follow even the repeated use of a solution of nitrate of silver. For these reasons I have not myself practised it, but the high estimation in which it is held by so eminent a gynæcologist as Courty, and the assurance he gives us that a large number of his pupils have constantly used it with success, prove, I think, that the application of the caustic itself is not followed by the serious consequences many have feared.

Mr. Clay, of Birmingham, has recently proposed to medicate the interior of the uterus by means of the insufflation of powders. He combines the remedial agent with finely powdered wood charcoal. The powder is introduced by a special instrument contrived for the purpose.

The last mode of intra-uterine medication is by using fluid applications—such as tincture of iodine, a solution of nitrate of silver, chromic acid, and the like,—which are applied to the uterine mucous membrane by some contrivance which admits of its surface being covered by the application without any amount of fluid being left in utero. This method of painting over the diseased surface is, to my mind, by far the safest and most effectual we can employ, having none of the objections which I have mentioned with regard to the others; and it is, indeed, on this principle that we treat morbid conditions of the mucous membrane in other and more readily accessible parts of the body —as, for example, in the fauces and conjunctiva.

One of the earliest and strongest advocates of this method is Professor Miller, of Louisville, U.S., who claims, and apparently with justice, to be one of the earliest advocates of systematic intra-uterine treatment, inasmuch as he practised and taught it so early as 1854. His method seems to be somewhat clumsy, consisting in pushing thin strips of lint, four or five inches in length and a quarter of an inch in width, saturated in the solution employed, through the cervix and up to the fundus, either by the uterine sound or by a two-branched instrument called a fluid *porte caustique*, within which the strip of saturated lint is placed. Such a manœuvre—of which, however, I have no practical experience—would appear to require more violence than one would willingly use. But before proceeding to a description of the plan I have myself always employed, I would wish to draw attention to the experience of a physician, who has for so many years adopted the practice, with regard to its safety. "Since that date (1855)," says Dr. Miller, "I have cauterised the cavity of the uterus a great many times, not only with nitrate of silver, but also with creasote, sulphate of copper, tincture of iodine, and even with acid nitrate of mercury, without any more pain than attends cauterization of the cervix, and without any evil consequences whatever. My own multiplied clinical observations compel me to dissent from the prevalent, if not universal, opinion that the cavity of the body of the uterus is a sanctum, which is much more sensitive than the neck, and will not brook any form of therapeutic approach—an opinion with which even Dr. Bennet is strongly imbued. I say again that I have not found it so; but, on the contrary, I treat the cavity of the body as familiarly, and with as little apprehension as I do that of the neck." The above was written in 1858; and in a *brochure* published in 1871, the author tells us that a farther experience of thirteen years has only tended to confirm his former views. Surely if the practice is so hazardous and fraught with danger as we have been taught to believe, it would be impossible for anyone with so large an experience in its use not to have long ago found out its risks. My own experience most amply corroborates Dr. Miller's; and I sincerely believe that an unfounded prejudice has caused us in England to neglect a most valuable remedy.

[In the following paper Dr. Playfair describes the method of proceeding he has himself adopted in the treatment of chronic intra-uterine catarrh, and which a considerable experience has convinced him is the most efficacious, as well as the most easily applied.]

It consists in applying the remedial agents in a fluid form to the interior of the cervical and uterine cavities by means of swabs. For this purpose I have had constructed a series of uterine probes, made of a soft metallic extremity, 2½ inches in length, corresponding to the ordinary measurements of the uterine cavity. These are made as fine as possible, and they are considerably less bulky than an ordinary uterine sound, so that when wrapped with cotton wool they are sufficiently small to pass readily through the os uteri.* They are attached to box-wood handles 9 inches in length, so that there is no difficulty in working with them through the speculum. The flexibility of the probes is of essential importance, as it enables us to bend them to the exact shape of the uterine cavity, just as we do the uterine sound; and thus intra-uterine medication can easily be used even in cases which are accompanied by the most well-marked ante or retro-flexions of the uterus, without the necessity of first replacing the flexion, as in other methods of treatment. I have, in fact, constantly treated cases of this kind without any attempt at altering the abnormal position of the uterus, and found that this has gradually disappeared as the uterus has assumed a more healthy condition; thus effectually showing that the flexion does not cause the uterine catarrh. Although I have done this, I by no means wish to be understood as recommending no attention to be paid to concomitant flexions in cases of the kind. On the contrary, the cure will generally be materially assisted by properly adjusted pessaries worn in the interval between the intra-uterine medications. Formerly I was in the habit of using probes of whalebone, which had a certain elasticity, and could be made very slender. These I have now quite discarded for the probes of flexible metal, on account of the property the latter possess of retaining the shape into which they are bent. The first step is to wrap the probes smoothly and evenly with cotton wool, and this requires some little practice to effect satisfactorily, the object being to surround the probe with a fine layer of wool so smoothly applied as to add but little to its bulk, and yet so firmly as to avoid all risk of its being detached when used. This is best done by taking a very small quantity of fine cotton wool, which is teazed out and flattened between the hands until it forms a layer of uniform thickness. The probe is then dipped in water to cause the wool to adhere, and then is wrapped round by rotating the handle, while the metallic portion with the layer of wool is held between the finger and thumb of the left hand. Two or three trials will enable you to do this easily, and when it is well done the cotton adheres so firmly that you will find it impossible to remove it unless by cutting it off, and so smoothly and evenly that the probe with the cotton applied is hardly thicker than it was before. If, however, it is clumsily and badly done, you may defeat your own object, by making the probe so bulky that it will no longer enter the os uteri. It is well to mount several probes in this way, some being required to wipe out the uterus and remove the adherent discharge, which might prevent the remedy coming in contact with the mucous membrane, and one which is dipped into the fluid application to be used.

We next expose the cervix by the speculum, which may be of any form we are in the habit of using. I confess my own preference for the ordinary Ferguson's glass speculum with a bevelled extremity, partly because none can equal it in illuminating power, and partly because there is a certain advantage in fixing the cervix in the extremity of the speculum. When the duck-billed or bivalved speculum is used the uterus is so mobile as to increase the difficulty of passing the probes satisfactorily. The first step is to clean the cavity of the cervix and uterus with a dry probe. The discharge will generally be found to have that peculiar tenacity which is so characteristic of cervical leucorrhœa, and it may be necessary to use more than one probe before it is removed. If we have ascertained the exact direction of the uterus, and bent the probe to correspond with its axis, taking care to pass it in accordance with it—for example, with its concavity backwards if it be retroflexed—we shall have no difficulty whatever. I must here repeat what I have before said, that the os is invariably open and patulous in cases suitable for this method of treatment, a condition which materially facilitates the necessary manœuvres. A little difficulty may be experienced in getting the point of the probe through the external opening of the cervical canal, or rather in finding it, but none in passing it onwards when this has once been entered. The utmost gentleness must be used, and if we meet with any difficulty it is better to desist, and certainly we should never permit ourselves to overcome the obstruction by force. In fact, the mounted probe should be coaxed into the cervical canal, never pushed in, just in the same way that we pass the male catheter when it does not enter readily. As a rule you will find it perfectly easy to perform this little operation, much easier than it is in most cases to pass the uterine sound. You will constantly find that as a case improves under treatment, as the catarrhal discharge lessens in amount, and the patient's sufferings diminish, so does the difficulty of passing the probes increase. When this is found to be at all great the case will usually be so much improved as to render it no longer necessary to pursue the intra-uterine medication.

---

* Manufactured by Matthews Brothers, Portugal Street, Lincoln's-Inn-fields.

The cavity of the uterus being wiped out with one or more dry probes, a probe dipped in the fluid to be used (the superfluous moisture being first wiped off in the neck of the bottle, so that none may run into the vagina) is passed like the others, and moved gently about so that the uterine mucous membrane may be thoroughly coated with the application. Then, if there be extensive abrasion, or a granular condition of the cervix, this may be swabbed over with the fluid, and the operation is finished. If the manipulations I have described be performed gently and carefully, as they ought to be, they are practically painless; nor does the application itself produce any suffering. Of course, if they are done clumsily and roughly the patient will be hurt, just as she would be if the uterine sound were passed by a bungling and inexperienced hand. You may depend upon it, however, that if you produce pain the fault is yours. I prefer that all this should be done when the patient is in bed, and that she should rest quietly for some time afterwards; but I have constantly been in the habit of treating such cases in the out-patient room, and have now done so for several years, and no case has come to my knowledge in which any ill effects have followed. I am justified in insisting on my experience on this point, because the opponents of intra-uterine treatment ground their objections on its supposed risks and hazards; and if I have never yet met with a case in which I have had the least reason to regret using it, it is surely no groundless assumption to assert that these dangers are purely imaginary, provided always that the cases are judiciously chosen, and the necessary manipulations properly performed.

With regard to the particular application to be used there is much difference of opinion. A strong solution of nitrate of silver, a saturated solution of tannin in glycerine, strong tincture of iodine, a solution of chromic acid, and even fuming nitric acid, have all been used, and are all, no doubt, more or less useful. I have tried them all, except the last, but I have found a strong solution of carbolic acid so immeasurably superior in its effects to them all, that I now use nothing else, and have every reason to be satisfied with it. The solution I use is prepared as follows:—Just sufficient water is added to the pure crystalline acid to keep it in a permanently fluid state, and the liquid so formed is a thick syrupy fluid of a pale pinkish colour, containing eighty parts of acid to twenty of water. To this I add an equal quantity of glycerine. I have often used the pure fluid carbolic acid prepared as above, and still constantly apply it to the exterior of the cervix when that is extensively abraded; but for the interior of the uterus I prefer to dilute it with glycerine. The effects of the carbolic acid are really remarkable, and may readily be watched on external abrasions. The slighter forms of these may often be healed by a single application, while even the worst kinds of granular erosion will be benefited by one or two applications far more than by double or treble the number of dressings with the solid nitrate of silver or tincture of iodine.

There are certain properties, too, possessed by carbolic acid, which render it preferable to all other caustics as an intra-uterine application. Neumann, of Vienna, has shown that when applied in a tolerably concentrated form, such as

I use, it causes the tissues to shrink and mummify, but they never swell; nor does it ever produce an eschar, as do the stronger caustics, such as potassa fusa, the acid nitrate of mercury, or even nitrate of silver. We can, therefore, use it freely without any risk of producing contraction of the canal of the cervix, a result which has followed the use of other agents, and which is said to be one of the objections to Courty's plan of using the solid nitrate of silver. Certainly no case has come under my observation where the slightest approach to such a result has followed the use of carbolic acid. I have no wish to depreciate other agents which are used, many of which are no doubt very efficacious, but inasmuch as I have never yet met with a case which has resisted the application of the carbolic acid, I have practically come to limit myself to the use of that alone.

With regard to the frequency with which the application should be repeated, I think that it should never exceed once a week, less often in slight cases, always taking care to have three or four clear days before the expected advent of a menstrual period, and the same time after its cessation.

One practical point is worth remembering, as ignorance of it might lead to disappointment. It not unfrequently happens that the first, or even the first two, applications are followed by an increase rather than by a diminution of the discharge. This is probably due to the unaccustomed stimulation of the diseased mucous membrane; and it is merely a temporary phenomenon. Almost immediately after the second dressing the discharge begins to diminish perceptibly; while the external abrasions, if any exist, assume a more healthy appearance, and soon entirely disappear. Very soon also there is a marked change for the better in the general symptoms; the backache and general symptoms become less constant and distressing, the general health improves, and the menstrual periods, which are frequently over-abundant, become less in amount and duration. This improvement, in favourable cases, goes on steadily until the patient is quite restored to health. The length of time during which it is necessary to continue the intra-uterine applications varies, of course, in different cases. Sometimes one or two have sufficed to effect a cure; at others, in cases of long duration which have become thoroughly chronic, it may be necessary to continue the treatment for many consecutive months. It is impossible to lay down precise rules on this point; but I consider no case of old-standing uterine leucorrhœa to be thoroughly cured unless the morbid discharge has completely ceased, until the cervix and body of the uterus have assumed a healthy appearance and feel to the finger, the general condition is so far improved as to enable the patient to follow her usual avocation, and the morbid patency of the canal of the cervix is no longer evident.—*Lancet, Jan.* 4, 11, *and Feb.* 15, 1873, *pp.* 3, 41, 230.

89.—ON THE VARIOUS MODES OF APPLYING REMEDIES TO THE INTERNAL SURFACE OF THE UTERUS.

By Dr. Robert Barnes, Obstetric Physician to St. Thomas's Hospital.

[Topical applications to the diseased mucous membrane of the uterus, are essential to cure in many cases of uterine disease; but, in the form of injected fluids they are not free from danger. There have occurred numerous cases of accidents attending the use of intra-uterine injections, varying from severe pain to shock, collapse, metritis, perimetritis, and death.]

To avoid the dangers of intra-uterine injections, several precepts have been enjoined. The great object aimed at is to avoid or lessen the risk of the fluid running along the tubes. This it is sought to attain—1. By securing free dilatation of the cervix uteri before injecting, so that the fluid may readily run back into the vagina. For this purpose the preliminary use of laminaria-tents is advised. 2. By using only graduated quantities of fluids and injecting very gently and slowly. 3. By using a double canula, so as to secure a return current. To effect this the more surely, the openings of the canula at the uterine end are made at different levels.

I have not much faith in the double canula. The end which should serve for the return-current is liable to be choked. The preliminary free dilatation of the cervix, and the use of gentleness in propelling the fluid, should never be omitted: but I do not believe that the observance of these precautions is an absolute guarantee against accidents. It is probable that the mere forcible impact of any fluid striking upon the inner surface of the uterus, especially upon the fundus, may cause severe pain and prostration. Since nothing is gained by forcible injection, this consideration affords additional reason for injecting with all possible gentleness; hence it is well to use injecting-pipes having lateral openings of very fine calibre, so as to "pulverise" the liquid.

I strongly advise not to use injections at all in cases of marked flexion of the uterus. Even if we dilate the cervix first by tents, and maintain the uterus erect during the injection, we cannot always be sure that the flexion will not be reproduced, so as to prevent the issue of the fluid; and it must not be forgotten that it is especially in these cases that the uterine cavity is likely to be enlarged, and the Fallopian tubes dilated.

The general conclusion at which I have arrived, is to restrict the use of intra-uterine injections within the narrowest limits. I rarely employ them now, except in cases of urgent danger from menorrhagia.

We may obtain almost all the advantages that injections are capable of giving by other means. For example, the same agents which are useful in the form of solutions for injection, may be employed either by swabbing, or solid, or in the form of ointment. Thus, where the use of chromic or nitric acid, or perchloride of iron, or iodine or bromine is indicated, these agents can be applied soaked on a sponge or piece of cotton, or on a glass—or hair pencil—the cervix having previously been well dilated. Nitrate of silver is far better applied in the solid form: even then it is liable to cause severe colic. The risk of this may be lessened by reducing the caustic, by fusing it with an equal part of nitrate of potash. The ordinary way of using the solid nitrate of silver—that is, by holding a piece of the stick in a forceps or porte-crayon—is objectionable. The piece may fall out or break, and a fragment left behind in the cervix or body of the uterus may give rise to intense agony, and even metritis. To avoid this accident, I have for many years adopted a contrivance I learned from Sir Benjamin Brodie, who armed the ordinary probe by dipping the end into nitrate of silver, fused in a watch-glass over a spirit-lamp. I use special probes of platinum of silver, mounted on handles of convenient length. These probes may be curved to follow the course of the uterine canal. This is far the best way of applying nitrate of silver to the os and cervix uteri; and it is the only safe way of applying it to the interior of the uterine cavity. The armed end of the probe may be passed into the uterus without the speculum, although the aid of this instrument is sometimes convenient. For example, unless the armed probe be protected by a canula, the caustic will first touch the vulva and vagina in its passage, which is apt to leave unpleasant effects, and the guiding finger of the operator will be stained.

One of the most widely useful topical applications to the mucous membrane of the cervix and body of the uterus is sulphate of zinc. The value of this agent, when applied to the relaxed or morbid mucous membrane of the vagina in the form of injections, is familiarly known: how to apply it to the uterine mucous membrane is, therefore, a matter of great interest. This has been accomplished by Messrs. Johnson, the well-known assayers, on the suggestion of Dr. Braxton Hicks, who prepared small cylindrical sticks of fused sulphate of zinc weighing three and five grains. These can be carried quite into the uterus without having touched the vagina by the way, by means of a canula, first made on my design by Messrs. Weiss, and now generally sold by instrument makers. It consists of a silver canula of the size No. 8 or 9 catheter, gently curved, open at the end, and supplied with a stilet or piston. The stick of sulphate of zinc or other material is placed in the uterine end of the canula; the instrument is then passed into the uterus just as the uterine sound is passed, the patient lying on her left side; and the operator's finger, placed on the os uteri, guides the instrument. It is a great advantage of this contrivance that the use of the speculum is quite unnecessary after it has aided in establishing the diagnosis which supplies the indication in treatment. When the instrument has gone the proper depth, the piston pushes out the stick, and the instrument is withdrawn, leaving the stick to dissolve. This it soon begins to do, and, by its speedy effect in constringing the mucous membrane, it keeps itself *in situ* until it is competely dissolved.

Nitrate of silver, reduced by admixture with nitrate of potash, may be used in the same way; so may persulphate of iron, but this should be considerably reduced. When used nearly pure, I have known it cause severe colic and bleeding.

A most precious way of applying astringents, caustic, solvents, or alteratives to the interior of the uterus, is in the form of ointment or pasma. In this way almost any substance can be applied. Where grease is objectionable as a vehicle, a pasma of suitable consistence may be made by aid of glycerine or other matters. In this form we may use substances which cannot easily be applied in any other way. For example, we can hardly use bromine, or iodine, or mercury, in a solid shape, and to use them in liquid form is open to the objections already discussed. Almost anything can be made into an ointment or pasma, and thus we get a complete practical command over a large range of useful agents.

To introduce ointment into the cavity of the uterus, Messrs. Weiss have made from my design a very convenient instrument, also capable of being used like a sound without the speculum. The instrument is easily charged by dipping it into the ointment—a sufficient quantity of which is carried into the uterus, and, by pushing up the piston, is deposited there.

If it be desired to apply a powerful liquid caustic, as chromic acid or strong bromine, to the interior of the uterus, this can be done by the ointment-carrier. A few shreds of asbestos may be packed in the space between the eyelet-holes and charged with the fluid. On ramming down the piston, the fluid will be squeezed out.

In discussing the action of powerful styptic injections in arresting flooding after labour, the conditions under which the practice I have recommended is indicated have not always been accurately appreciated. The great agent, of course, in stopping hemorrhage, is the constriction of the uterine vessels by the muscular wall in which these vessels run. All the ordinary means of arresting hemorrhage are aimed at producing muscular contraction. But muscular contraction depends on nervous power. Thus cold, grasping the uterus, introducing the hand, galvanism, all depend for their efficacy upon the spinal cord being able to respond to the peripheral call. When, therefore, these means prove sufficient, the inference is *generally* warranted that the case, although serious, is not desperate. The condition is very different when the excito-motor function is suspended; when neither by peripheral excitation, nor by centric stimulus, the nerve-force can be drawn or sent from the spinal cord to the uterus in sufficient intensity to cause contraction. At this point, unless the bleeding is arrested by syncope, or by temporary enfeeblement of the circulation, the patient is in the most imminent danger of death. The slightest shock or disturbance will extinguish the flickering spark of life. Under such circumstances I have known death follow, to all appearance immediately caused by the injection of cold water, or passing the hand into the uterus. If, instead of cold water, we inject a solution of perchloride of iron, the same catastrophe may ensue. Is it more likely to ensue? Very careful observations are required before this question can be answered in the affirmative. People are apt to think that cold water is so simple a thing that it cannot do any harm. But if it cannot do any harm, is it not probable that it is, under the conditions discussed, equally powerless to do any good? Harmless remedies, as a rule, fail in great emergencies. Now, cold water fails not because it is harmless, for the shock and depression which it causes are extremely dangerous; but it fails because, nervous power being exhausted, it cannot excite uterine contraction, and it has no other virtue in arresting hemorrhage.

Here, then, it is that styptics come to the rescue. The emergency is extreme, and would be desperate but for the new power invoked. If blood be still running, it is instantly seized at the mouths of the vessels, which become sealed up by coagula. It also constringes the inner surface of the uterus, and thus further closes the vessels. The system then has time and opportunity to rally, and by and by the contractile power returns. In estimating the relative value, then, of cold water and perchloride of iron, we must reflect that iron acts and saves life when water is inert or injurious. If occasionally death follows, and is apparently accelerated by, the iron injection, we have, on the other hand, to remember that it was used as a last resource, when the patient was likely to die even if nothing were done, and that even under these unpromising conditions *many lives, to all appearance doomed, have been saved.*

The great lesson to learn is to take courage to use the styptic in time; that is, before the vital power has sunk too low. It was not to be expected that a remedy powerful enough to save under the last extremity should be altogether free from danger. But I have seen so many women bleed to death, and have seen so many saved by the timely use of the iron injection, that I am much more afraid of the bleeding than of the remedy.

In some cases, there is reason to believe that the iron enters the uterine vessels. I have known intense pain in the uterus follow immediately on the injection. How is this explained? If blood were present in the vessels, it is a chemical necessity that contact with the iron would cause coagulation. I infer, then, that in some cases the vessels are for a time nearly empty; and that there is a certain amount of suction-action induced by the relaxed state of the uterus, and by the lateral or semiprone position of the patient. I would therefore urge that the patient be placed on her back, and that the uterus be grasped firmly between the two hands of an assistant during the injection.

In some cases, it is easy to carry a swab or sponge soaked in the iron solution into the uterus. In this way probably some of the risk attaching to injection is avoided. The persulphate of iron, which is preferred by our American brethren, may have its advantages. Its styptic force is probably greater. It may be used in the form of one part of the liquor ferri persulphatis of the British Pharmacopœia to six or eight of water. The proper strength of the perchloride solution is one in ten.—*British Medical Journal, Jan.* 11, 1873, *p.* 31.

90.—ON OVARALGIA.

By Dr. T. Clifford Allbutt, Physician to the Leeds General Infirmary.

If gastralgia be mistaken for dyspepsia, far more commonly is ovaralgia misunderstood. Indeed, the existence of ovaralgia, as I understand it, is by no means familiarly known to the profession.

The irritable uterus of Gooch was, and perhaps is, a phenomenon of which few medical men would be called ignorant; but I am sure that it is a very different thing to the ovaralgia of which I have seen many marked examples. I cannot say that uterine neuralgia is an ailment which has come very prominently before me, though, as all our experience is accidental, it may well be common for all that. Women, however, in my experience such as it is, complain to physicians far more often of unilateral pains and pains which are evidently periuterine, than of pains which are actually seated in the womb itself. For it is not quite accurate to give the name neuralgia to those uterine pains and irritations which accompany other disorders of that viscus. All the uneasiness and misery which result from displacements and from local diseases, such as ulcers or tumours, must of course be eliminated. Cases of irritable uterus, again, cannot be called cases of neuralgia proper, for in almost all of them there is also some menstrual disorder, or the pain attends the normal menstruation, when the necessary congestion burdens and irritates the hyper-æsthetic tissue. In this view I am supported by the valuable opinion of Dr. Handfield Jones, and he will, I think, wish with me to preserve a distinction between hyper-æsthesia and neuralgia. In my selection on gastralgia I have spoken likewise of gastric hyper-æsthesia as occasionally implicating gastralgia, but it is not gastralgia; on the contrary, I have notes of many interesting cases of pure gastric hyper-æsthesia with which gastralgia was never associated, and which rather simulated ulcer or chronic gastritis. To turn also to the ovaries themselves, there is such a thing and a common thing too, as hyper-æsthesia of the ovaries, but this differs entirely from ovarian neuralgia, as I should describe it, in which the ovaries need not be very tender to pressure, though of course they sometimes are so continuously and often are so soon after an attack of pain. In ovaralgia there is often no disorder of function whatever, but acute aching or, it may be, agonising pain. This pain, when severe, is too often mistaken for urinary calculus, lithiasis, or even for peritonitis. This latter is a sad blunder, but I fear far from rare, if I may add my own observations to the warnings of Dr. Addison, who, says Dr. Dr. Jones, "appreciates fully the difficulty there may be in distinguishing abdominal neuralgia from peritonitis." The ovarian neuralgia to which I refer comes on either as a mere weight or burning, or as a true 'tic.' As in the case of Mrs. Mc——, it often comes in a moment and continues as an agonising paroxysm for one or several hours. The pain may dart from the ovary of one side, often thence downwards towards the perineum or upwards to the false ribs even to the arm pit, though sometimes we have to allow for a little exaggeration in descriptions of severe pain. The pain rarely occurs in both ovaries at once, though it frequently attacks them alternately. The occurrence of the pain does not seem to depend upon any well defined immediate cause, for it may occur at almost any hour of the day. Indeed, its demeanour is in every respect very like that of ordinary facial tic. There need not be and often there is no coincident local disorder of any kind, though a local cause of irritation—such as ascarides, for example—no doubt might determine an outbreak. At the same time I think sexual excitement may not infrequently be accused of some complicity in the attack. This is a subject on which clinical questioning is almost impossible; but I have seen severe uterine neuralgia twice in newly married women, and once in a married woman who was believed by her own medical adviser to make great claims upon her husband. That the immediate cause of the attack in a predisposed person was in another instance the combined influence of cold and fatigue seems clear. As mastication again may bring on facial tic, and food may bring on gastralgia, so ovaralgia is often produced by quick walking or running. Ovarian ovaralgia will need the same general treatment as the other neuralgias; quinine and steel being more especially useful. As a palliative measure hypodermic morphia has the same marvellous value that it has in gastralgia and in every other form of nerve pain. But year after year adds to my conviction that the remedy is as dangerous as it is effectual. In a paper published some time ago in the Practitioner I drew attention to the unquestionable fact that the use of the morphia syringe tended even more surely to become a habit than the use of anodynes in other modes and forms. Those who have learnt to fly to the syringe, as a remedy from instant pain, soon discover that in it they find also a most effectual stimulant. Delicate ladies, when under the influence of the injection, can stir about their houses, can frequent dinners and balls, can receive company at home and feel generally hungry, active and gay, to a degree before unknown to them. Hence its terrible fascination for them, a fascination which seemingly is as potent when once established as that of alcohol. Like alcohol, too, it creates the recurring need for its repetition. The dose may not be greatly increased, the sixth of a grain may not grow to more than half a grain or a grain, but the system claims it again and again, and denial seems cruel or even impossible. When the influence passes away a state of depression seems to come on,—a want, a sense that the lamp of life must be re-trimmed, and many persons have not the strength to resist this. Not only so, but this very reaction becomes the cause of a renewal of the neuralgia, so that the morphia treacherously keeps alive the very pains it pretends to relieve. A lady of great intelligence, and a great sufferer from neuralgia, told me that she discovered the temptation of morphia injections after the first half-dozen operations, and she decided to bear pain rather than run the risk of becoming a slave to them. Among numberless cases of a contrary kind I may mention one of a brave lady, suffering from intense cervico-brachial neuralgia and habituated to the use of the syringe, who, in obedience to our urgent wish, broke the habit, and the pain gradually ceased to return. On the other hand a medical friend, who lives away from Leeds, told me that a lady stopped him one day in the street, and begged him to give her an injection in his brougham, as her syringe was broken and her own medical man was out of town. This lady was not at the time suffering from actual pain, and, much to her displeasure, he declined to operate. Therefore I would warn my readers not under any circumstances to permit the use of morphia in this way to become periodical, or they will find the last state worse than the first. In old persons with neuralgias that are admittedly incurable the periodical use of hypodermic morphia may, as Dr. Anstie argued in a review of my paper, seem the lesser of two evils, and may not indeed be any great evil; but in younger persons it should be discountenanced for two reasons, namely, 1, the regular use of it sets up a periodicity in the system which actually favours the return of pain; and, 2, during that regular use all other treatment loses much or all of its power. Case after case has come before me, of late years, in which I have seen, not only the establishment of a periodic pain in spite of all remedies, but also, in addition to this, a love of intoxication, with slow and almost imperceptible deterioration of mental stability and calm intelligence which has defied all management. Several brave persons suffering from gastralgia, hepatalgia, facial tic, ovaralgia, &c., &c., at my urgent entreaty have broken off the habit, and in these cases, without any special treatment the neuralgia has *pari passu* given way likewise, while it had previously defied even the continuous current. Therefore I feel very strongly opposed to the regular use of this potent remedy by neuralgic persons. It should not, generally speaking, be taken out of the hands of the medical attendant, and it should be used avowedly as a palliative on special occasions only, not at regular intervals. I need scarcely say that hypodermic morphia often cures neuralgia, and to this end may well be used for a few days consecutively, or several times a week. Still, the medical man must assuredly bear in mind that, if he does not cure the ailment, he is in danger of establishing a habit both of intoxication and of the neuralgia itself. With him the responsibility must rest of drawing the line between its use as a curative means and its use as an habitual palliative and stimulant. The same difficulties which have limited my experience of the continuous galvanic current in gastralgia, apply with even more force to ovaralgia, in which complaint I have indeed never made a trial of it. Fortunately, so far as a few cases can prove, we seem to have in quinine, liberally given, an almost specfic remedy. It may not act more decidedly in ovaralgia than it does in trigeminal tic, but, curiously enough, it is at least equally valuable. In iron and arsenic then, as chronic remedies, and in quinine or hypodermic morphia, as immediate remedies, we may find a tolerably sure cure.—*L'pool and Man. Med. Reports*, 1873, *p.* 119.

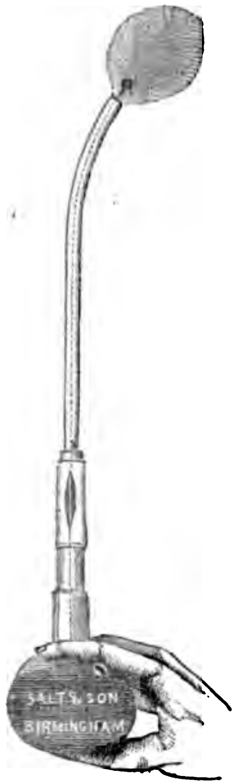
91.—NEW INSUFFLATOR FOR TREATING DISEASES OF THE UTERUS.

By John Clay, Esq., Obstetric Surgeon to the Queen's Hospital, Birmingham.

Having used the insufflator (see Lancet, Nov. 30th, 1872) in a number of cases of diseases of the uterus, and proved its thorough efficiency in every respect, I have had an engraving of the instrument made, which I here introduce, together with a description of the mode of using the instrument.

The instrument is made of the same length and shape as Simpson's uterine sound, and after the model of the "alum puff" used for insufflating the larynx; but instead of having an open end, which would render it liable to be plugged with mucus during its introduction into the uterus, and which would prevent the escape of the powder, the instrument here depicted is provided with a movable bulbous head, which closes the end of the tube. The pressure of the thumb on the rubber ball opens the end of the tube and ejects the powder at the same time, as shown by the engraving. When the pressure of the thumb is removed from the ball, an internal spiral spring retracts the bulbous head, and thus facilitates the withdrawal of the instrument.

The powder is placed in the aperture seen at the lower end of the tube, near to the rubber ball, and is secured by means of a sliding ferule not shown in the engraving.



Messrs. Salt and Sons, Birmingham, surgical instrument manufacturers, have been very successful in producing a neat and efficient instrument.—*Lancet, Feb.* 1, 1873, *p.* 166.

92.—INTRA-UTERINE INJECTIONS.

By Dr. J. Whitehead, Physician to the Children's Hospital, Manchester.

In the British Medical Journal [see Art. 89, p. 224] Dr. Barnes has treated, with skill and judgment, a subject in pathology of considerable importance. Chronic endometritis, with uterine catarrh, is by no means of uncommon occurrence, and is a frequent cause of a distressing form of dysmenorrhœa, as well as of sterility, especially in early married life, but also at a later age.

Somewhat more than twenty-seven years ago a case occurred to me illustrative of some of the inconveniences which Dr. Barnes mentions as liable to happen in the treatment of such cases. A patient in private practice, six years married and without progeny, laboured under yellow vaginal discharges and membranous dysmenorrhœa, which I had reason to believe to be of gonorrhœal origin. After a prolonged treatment by vaginal injections and constitutional remedies with no beneficial effect, I found, on specular inquiry, an extensively denuded and granular state of the lower section of interior brought into the field of view. To this surface I applied a strong solution of nitrate of silver (one drachm of nitrate, three drachms of water) on saturated lint, and maintained this *in situ* by additional dry lint pushed up through the speculum. In the space of two or three hours later I was urgently summoned to the patient, and found her labouring under most violent pains of the abdomen, which soon becam tympanitic and exquisitely sensitive to the touch. Opiates were freely given, and fomentations and poultices used throughout the night; at early morning the pain was mitigated and she slept. In the course of two or three days all the troubles disappeared, and she was restored to her customary health. Pregnancy took place within five or six weeks after this event, and was followed by two more pregnancies, all equally successful. I felt no doubt that the solution of nitrate of silver had been transmitted, by ciliary action, through the uterus and along the Fallopian tubes to the abdominal cavity.

Feeling encouraged by the result obtained in the preceding case, I injected shortly afterwards, in two similar cases, by means of a catheter syringe, a small quantity of the same solution within the uterus; and in both had like disturbances—being obliged to keep the patients under active treatment in my own house for two or three days with the aid of other professional counsel. Both patients, however, did well; both were cured of uterine trouble; and both bore children.

These cases, however, although satisfactory in the issue, were much too troublesome, if not dangerous. I have therefore since adopted the plan of injecting, by a graduated catheter-syringe, no more than twenty or thirty minims of a much weaker solution, viz., a grain and a half to the ounce; and the moment this quantity has been introduced, I quickly draw back the piston of the syringe so as to bring away all the fluid that is not immediately absorbed. Under this plan I have not had an unfavourable symptom—with the exception, perhaps, of a little uterine tormina of short duration, and almost always a satisfactory result.

I have witnessed as severe peritoneal suffering from the injection of pure cold water as from the strong nitrate of silver solution; but water at a temperature of 100 deg. F. does not occasion distress beyond a sense of tormina of a few minutes' duration. It is evident that fluids injected within the uterine cavity—*without force*, and in small quantity, may mount by ciliary action through the Fallopian tubes into the peritoneal cavity with great quickness. The cold water injected on two occasions in very small quantity, the piston of the syringe being quickly withdrawn, could not have lost more than one or two degrees of its coldness before entering the peritoneal cavity, and its presence there was manifested in less than thirty seconds.

But of late years I have nearly abandoned injections into the uterus, I find it better and safer, and attended with much less trouble, when treating chronic endometritis, to apply remedies by means of Lallemand's porte-caustique. This instrument, although intended for the male urethra, is quite as useful for the female in cases of endometritis. The groove of the stilette, charged with an ointment of nitrate of silver of suitable strength, or with axunge, the surface of which, covered with finely powdered nitrate of silver, sulphate of zinc, per-chloride of iron, or any other remedy, being drawn into the canula, can be safely introduced through the first passages. On arrival within the uterine cavity, the stilette must be protruded and rotated by manipulation of the handle, by which means the remedy is brought freely into contact with all the surfaces of the cavity. This part of the process should be done slowly, in order to allow the charge in the groove to melt and lubricate the whole interior of the organ.

In my experience, this mode of application of remedies to the interior of the uterus has not been followed by any metritic or peritoneal disturbance whatever, and frequently has resulted favourably.—*British Medical Journal, Feb.* 1, 1873, *p.* 115.

93.—GUAIAC IN OVARIAN AFFECTIONS.

By Professor Cleland, F.R.S., Galway.

[Guaiacum is a remedy which formerly enjoyed more reputation than it now does.]

I have now used it for about two years in cases of amenorrhœa, and in inflammatory affections of the ovaries. One of the first cases in which I tried it was an ophthalmia in both eyes in a girl of seventeen. It baffled all local treatment: twice I clipped the conjunctiva for pannus, but with only temporary advantage. At last, after it had continued for months, believing that the disease might depend on the non-appearance of the menses, of which the patient had only once in her life seen any indication, I gave resin of guaiac in ten-grain doses daily, and had the satisfaction of seeing the patient soon leave the hospital perfectly well, without any other treatment. Since that I have frequently used the same prescription for amenorrhœa, and sometimes with marked success. Thus, within the last fortnight I saw a girl of fourteen, who had been under my care before for acute synovitis of the knee joint, excited in the first instance by a slight wound from an ivory crochet needle. There had been more than one relapse, and on this last occasion the inflammation had been allowed to become so violent that suppuration took place, and I was obliged to establish a drain. Having regard to the tall flabby appearance of the girl, and the slightness of the original irritation, I thought it probable that the state of her constitution at her age might have something to do with the disease of the joint. I ordered her ten-grain doses of resin of guaiac daily, and she only had taken four of them when her first menstruation come on. The knee progresses favourably, and the patient's general appearance is improved. No doubt it may be alleged that both in this and the previously mentioned case, the supervention of the menses on the exhibition of the remedy may have been mere coincidence; and so perhaps it might; but when such coincidences happen frequently one learns to believe in the remedy.

Quite as remarkable are the effects of guaiac in ovarian affections of inflammatory origin. I remember one instance in which the patient had been for years suffering from severe attacks. When I was called in the pain in one side was acute, preventing sleep; leeches were applied, and bromide of potassium given; and, when that failed, a course of arsenic was resorted to with good effect, setting the patient on her feet. But, on an opportunity occurring to make inquiries, more than a year after, I found that her health was by no means quite reestablished, and that there was still the debility and pain in the back, characteristic of sexual derangements, and making life miserable. Guaiac was ordered; and the next time that I met the patient's mother her gratitude was great, as she told me how her daughter had got so suddenly perfectly well. I might mention other cases in which the effects of this remedy have been quite as marked; but my position is this: that, while I have seen enough to convince me that it is my duty to mention to others, who have better opportunities of testing practical points, a neglected action of an old remedy, I have not myself sufficient opportunity properly to investigate the laws which regulate that action. Taking, however, into account the cases in which I have tried guaiac without seeing any effect, I conclude that it is useless in acute cases, and in those in which the primary disorder is situated, not in an ovary, but in the uterus. I have never seen any great benefit from guaiac where there was a marked affection of the cervix uteri; but I have often seen it act where there was great pain and weakness in the back complained of, and even slight leucorrhœa.

I usually order guaiac in doses of ten-grains of the resin every morning; but that amount is sufficient, with many patients, to produce diarrhœa after it has been continued for a few days; it is, therefore, well to prepare the patient for that happening; and as there seems to be no connexion between the therapeutic benefits and the action on the bowels, she may be directed to take only one every second day if diarrhœa is threatened.

I may mention that I was led to try the effect of guiac in ovarian cases in a curious enough way. It had been brought under my notice by a medical friend, for whose opinion I have great respect, that it had great virtue in cases of persistent sore throat; and this I found to be true. I then remembered the old belief, not altogether groundless, of a sympathy betwen the tonsils and the testes or ovaries, and that induced me to experiment.—*Irish Hospital Gazette, Jan.* 1, 1873, *p.* 6.

ADDENDA.

94.—ON METHYLENE ETHER OR ETHYL.

By Dr. Benjamin W. Richardson, F.R.S.

Since my announcement of the introduction of methylene ether as a genera. anæsthetic, the vapour of this fluid has been administered by many practitioners with so much satisfaction that a word or two more may now, I think, be said of it with advantage. Its physical properties, its physiological action, and its practical utility are the points on which I would briefly treat.

I first made the solution I now call methylene ether, or ethyl, in 1869, and I administered it in several cases for short surgical operations. I was struck then by the regularity of its action, but I looked upon it as a mere mixture of two fluids having very similar physical qualities, and I let it pass with little further notice until last year, in order to search for a fluid possessing similar physiological properties and simple in construction. Returning to what I still supposed to be a mixture of two distinct fluids, I described the effects of methylene ether, as a mixture, in a previous number of this journal. It has been proved since that the fluid is not a mere mechanical mixture of two fluids as originally supposed.

In order to insure a definite compound, I requested Mr. Robbins to mix absolute ether of specific gravity ·720, and pure bichloride of methylene of specific gravity 1·340, in an estimated proportion of each, so as to insure a specific gravity of the combined fluids of 1·050. In endeavouring to accomplish this Mr. Robbins observed that he could not get the required gravity from the proportions of the fluids respectively employed, although the result ought to have been as expected, by calculation from their weights. Mr. Robbins observed, further, that on mixing the two fluids there was a rise of temperature amounting to 21·5° Fahr. when equal parts of the fluids were blended.

A few days afterwards Dr. Archbold reported to me independently that he had observed a similar fact in reference to the gravity of the combined fluids, and he added that upon distilling the mixture, made by adding together absolute ether and methylene bichloride, over chloride of calcium, a deposit of carbon, with water, was left in the retort. He further found that the fluid he had distilled over was free of oxygen, so that it failed to act on potassium. The facts thus obtained indicate that when methylene bichloride and absolute ether are mixed there is produced a new chemical combination, probably a combination of the radical ethyl (C_4H_{10}) with methylene bichloride (CH_2Cl_2). A specimen made in the manner described, and which I have recently used, has the specific gravity of water (1000); it begins to boil at 90° Fahr., boiling steadily and equably; it shows a very feeble action on potassium; it possesses an odour entirely distinct from ether; it is much less pungent than chloroform or methylene bichloride; and it is but little irritating when applied to the surface of the skin.

The physiological action of methylene ether of the quality thus named is an improvement on that which I originally employed. It is very rapid in producing effect. From one to two fluid drachms will induce, in the space of a minute and a half to two minutes, sufficient insensibility for a short operation, while from two to six drachms are sufficient for the production of prolonged anæsthetic sleep. The sleep induced is gentle, and is very rarely attended with convulsive movement. The pupil undergoes very slight variation, as a rule, but is sometimes a little dilated when the narcotism is deep. Vomiting is less frequent than from chloroform, methylene bichloride, or ether; it does exceptionally occur, but is of brief duration.

When in an inferior animal the administration of methylene ether is carried to an extreme, it is difficult to decide which function fails first—that of circulation or respiration. I think the respiration fails first; at all events, respiration may be brought to a standstill, and yet the animal may be easily made to recover by artificial restoration of the function.

Practically, methylene ether bids fair to hold a permanent place in surgery. Mr. Lawson Tait has now administered it thirty-three times for long operations, and has had but two instances of vomiting in all. He finds the anæsthesia produced by it to be deep, calm, and effective, easily brought on, and quickly and easily recovered from. In all respects, in a word, his experience of it accords with my own.

From the physical characteristics of methylene ether, and form its physiological properties, I should infer that fewer deaths will occur from its use than from chloroform or even methylene bichloride, and that it may prove equally safe with common ether, over which it possesses, as a practical agent, all the advantages of chloroform and of methylene bichloride. I do not claim for methylene ether that it is absolutely safe, for the possession of a general anæsthetic devoid of all danger, though it will, by infinite labour, be one day discovered, is as yet only a delusion of idle, untaught minds. I shall make no apology for methylene ether if it prove occasionally unsafe; but I submit it simply as a rational advance in anæsthetics, for the profession "to well and truly try."—*Medical Times and Gazette, Feb.* 15, 1873, *p.* 164.

95.—METHYLENE ETHER AS AN ANÆSTHETIC.

By Lawson Tait, Esq., Surgeon to the Hospital for Women, Birmingham.

By the introduction of this new anæsthetic, I feel sure that the days of chloroform as an anæsthetic for any but obstetric operations are numbered. The new substance has the following advantages over chloroform. Its action is much more rapid, and is entirely free from the muscular and cerebral excitement often seen in the use of chloroform; the quantity used is less; and sickness after its use is most exceptional, the recovery from the anæsthesia being extremely rapid and complete. Over sulphuric ether it has the advantage, that it is very pleasant to take, and that a tenth or twelfth of the quantity is sufficient.

I have used it about thirty times, and in only one instance was there any sickness, and in that case the lady had just before the examination been partaking freely of underdone mutton.

I have performed the following operations under its influence within the last six weeks, and in no instance has there been any sickness due to the methylene ether. A simple ovariotomy in which only three drachms of ether were used; successful. Removal of both ovaries, in which the amount used is uncertain, but was probably about four drachms; successful. Removal of the fundus uteri and both ovaries; a long and tedious operation, in which about two ounces of the ether were used, and in which no bad symptom has yet appeared (fourth day). This patient was sick some hours after the operation, but that was due to morphia. A long and tedious operation for retained menstruation, in which seven drachms were used; successful. I have placed this patient under the influence of the ether eleven times, and she has never been sick. This repeated administration is for the passage of the finger up to the cervix, and the whole process, including the complete recovery from profound anæsthesia, never takes ten minutes. Removal of a large fibroid, and, in the practice of my colleague, Mr. Ross Jordan, the removal of the fœtus from the broad ligament successfully, together with several minor operations, and its administration for the purposes of uterine or vesical examination, complete my experience of this new anæsthetic; and I shall use no other for surgical work until I obtain some disastrous result, a misfortune that at present seems more unlikely than by the use of either ordinary ether or chloroform. I may add that its use is more economical than that of either ether or chloroform.—*British Medical Journal, March* 8, 1873, *p.* 254.

96.—PRACTICAL OBSERVATIONS UPON ETHER AS AN ANÆSTHETIC.

By Dr. Charles Bell Taylor, Surgeon to the Nottingham and Midland Eye Infirmary.

[Alarming collapse occurred in the case of a gentleman upon whom Mr. Taylor was about to operate for cataract, before insensibility was completely induced by chloroform. In consequence of this, various attempts at production of anæsthesia by ether were made in other cases with the object of testing the applicability of it to this particular case. All results obtained were more or less unsatisfactory.]

It was not until I had the pleasure of meeting Dr. Joy Jeffries, of Boston, at the College of Physicians, on the occasion of our Ophthalmological Congress, that my difficulties respecting ether were overcome. The information that gentleman was kind enough to convey to me I propose now, after an experience of upwards of 100 cases, to make known to the profession.

The ether must be pure, and what is termed anhydrous, of specific gravity 720, and it may either be administered by a very ingenious apparatus devised by Professor Morgan, of Dublin, or after the practice of Dr. Joy Jeffries by means of a napkin or sponge. As soon as the patient has reclined in a position suitable for operation I cover the mouth and nostrils with a cone-shaped sponge, such as may be seen in any druggist's shop, and then direct the patient to cough, take a deep breath, and fully inflate the lungs. As soon as he is doing this satisfactorily, I pour over the summit of the sponge an ounce or more of ether, and carefully, with both hands, preclude the admission of air from the sides. All that is further necessary is to encourage the patient to breathe freely, and to keep on adding ether without stint. If excitement comes on, the sponge should be held firmly, and the dose of the anæsthetic increased. As a rule, insensibility is in this way speedily induced. Indeed, one of my colleagues who saw it for the first time decided that the effect was produced quicker than with chloroform, an opinion in which I did not concur. If the patient breathes stertorously or becomes blue in the face, or any blood that may be flowing assumes a dark tint, the sponge should be removed for a few seconds, not longer, as recovery is rapid, and time will be wasted if air is admitted. As a rule, throughout the administration, the pulse keeps full and bounding, and the face is flushed. There is no collapse, pallor, falling back of the tongue, or other of those dangerous symptoms which we notice so frequently with chloroform or methylene. Speaking generally, also, it answers remarkably well in those cases where it is more specially indicated, such as in very feeble patients, worn-out marasmic individuals, and in children, as also in cases where prolonged anæsthesia is necessary.

The great danger in chloroform inhalation arises from failure of the heart's action—a risk from which, so far as I can judge, ether is absolutely free. Dr. Joy Jeffries considers that it would be difficult to cause death with ether even if anxious to do so—a conclusion apparently borne out by statistics, which show that while death has been attributed to ether once in 23,204 cases, chloroform has been credited with 1 in 2873. The smell of ether is disagreeable to patient and operator; I think it would be even injurious to anyone who is daily engaged in its administration; it is also persistent, and would be noticed at the street door of any house wherein it is administered. The drunken excitement, too, is objectionable, often developing itself in idiotic laughter, execrations, or psalm-singing. Vomiting occurs about as frequently as after chloroform. The patients often breathe with difficulty, raising the head and shoulders at each inspiration. It is difficult to obtain complete muscular relaxation with it; and the sponge or other apparatus, which cannot be removed even temporarily, is in the way of the operator in cases where the eye or face is concerned.

I don't think, for these reasons, that ether will ever take the place of chloroform; but it is unquestionably a valuable anæsthetic in cases where chloroform is inadmissible; and by using it in conjunction with that agent the danger of the latter is very much diminished. The best way of doing this is to administer ether until insensibility is induced, and then to go on with chloroform. The stimulant effect of the blood saturated with ether neutralises the depressing effect of chloroform. A dash of ether following chloroform has a similar effect, as Dr. Charles Kidd has pointed out; but I believe the former is the better course when danger is apprehended, and where the desired effect cannot be obtained by ether alone.—*Lancet, Dec.* 21, 1872, *p.* 879.

97.—THE DANGER OF CHLOROFORM AND THE SAFETY OF ETHER AS A MEDIUM OF PRODUCING INSENSIBILITY TO PAIN.

By Dr. J. MORGAN, Surgeon to Mercer's and to the Westmoreland Hospitals, Dublin.

[The worst of the danger attending the use of chloroform is its suddenness and uncertainty. It is most likely to occur in persons not exhausted by disease, and while an operation is being performed where no immediate danger is at all to be apprehended.]

It may fairly be inquired, can a safer anæsthetic be ascertained, or one which will produce as perfect a state of insensibility without compromising the life of the patient? As I believe, on calm investigation, and on laying aside the prejudices which the habitual use of chloroform may arm us with against ether as an anæsthetic agent, that nevertheless ether furnishes arguments in its favour which are unanswerable, specially when the great question of safety comes to be considered. The American surgeons, and many on the Continent, prefer it as an anæsthetic, chiefly on account of its safety. Dr. Jeffries, in a paper at the late Ophthalmological Congress, remarks that "it is almost impossible to kill a person by etherisation."

In an elaborate paper read by Dr. Coles on the subject at the Medical Society of Virginia, 1871, the following tabular result was found, when the statistics collected by Dr. Andrews in America, and by Dr. Richardson in England, were compared:—

Agent employed.	Deaths. Inhalation.	Or
Ether	4 to 92,815	1 to 23,204
Chloroform	53 to 152,260	1 to 2,872
Mixture of chloroform and ether . .	2 to 11,176	1 to 5,888
Bichloride of methylene . .	2 to 10,000	1 to 5,000

Proving that chloroform is *eight times* more dangerous than ether, and is the *most dangerous* of all anæsthetics in use.

Attention to details is as essential to the perfect administration of ether as in many other procedures of importance.

The ether vapour should be freely applied. From its volatility this entails a certain difficulty, which I have succeeded in overcoming by a simple and efficient arrangement of an inhaler. This is made of a sufficient capacity to allow the diffusion of the ethereal vapour. It is furnished with a series of frills in the interior, which facilitate the volatilisation of the ether by its trickling over them; and the upper part of the inhaler is supplemented by an india-rubber diaphragm. An elastic tube conducts the vapour from the bottom (where, from its gravity, it descends), and a mouthpiece, filled with a water cushion around, can be so aptly applied that but little air can enter. The elastic diaphragm allows the respiration to be carried on *within* the inhaler, while the ether vapour is constantly accumulating within, by evaporation. If the diaphragm be watched the respiration can be fully observed. At first it will be shallow, but gradually increase; and as anæsthesia supervenes, it will become more full and energetic; the more profound the anæsthesia, the more full will be the respirations.

Sensibility will, for the time, be extinguished ; the patient will lie with the face somewhat congested, overwhelmed as it were with a deep sleep, and may snore; the eyes are usually open and slightly upturned, and the pupils usually dilated. This condition is perfectly manageable; the mouthpiece may be withdrawn for a time, and re-applied when signs of returning sensibility appear, or air may be admitted into the inhaler by a simple arrangement in turning the cap of the supply tube. I prefer taking away the mouthpiece and letting the patient breathe—should it again be required—the concentrated vapour from the inhaler.

It might be supposed that the frequent re-breathing of the same vapour would be impossible—this is not so. Whether from the diminished formation of carbonic acid, or from the fact that the diminished sensibility caused by the ether vapour, allows the breathing of the carbonic acid, or from both, the patient can re-breathe the same vapour over and over again. That a diluted form of carbonic acid is not so very dangerous is shown by the fact observed in the mining districts in Cornwall, for instance, where the work goes on in gangs; the foremost labourer, with a knowledge that he may become insensible, relies on his rear-rank companion to draw him out when he becomes so, which he does in due time, and steps on himself to undergo a similar ordeal, although a lighted candle would go out, and it was impossible to remain over ten minutes.

On reviewing the practice of the American surgeons more particularly, it will be observed that those practitioners—who are most solicitous in excluding air—report the best results, and assert, as the result of their experience, that "anæsthesia may be induced by means of ether as quickly as can safely be done by means of chloroform, and with a quantity weighing less, and costing very little more than the requisite amount of the latter;" at the same time it is observed that it is "endeavoured to prevent any, even the slightest, admixture of air." The nitrous oxide gas, which has gained some support as an anæsthetic, in like manner acts most efficiently when breathed without the admixture of air; and in various comparative observations I have made, by admitting and excluding a free mixture of air, I am satisfied that anæsthesia is more perfect and more devoid of inconveniences when the ether vapour is freely taken in.

On comparing the effects with those of chloroform, where the patient is some time submitted to the influence, occasionally there is some excitement in strong or nervously constituted persons, and in men more especially; but it is nothing like that seen so often in chloroform inhalation, and very soon subsides. If the exhibitor stands behind the patient, and applies the mouthpiece equably and firmly over the *mouth and nose*, the condition will pass in a moment or two. It does not occur in many patients; and in whatever degree it shows itself, it indicates that the patient is on the verge of insensibility, and that the administration is to be pressed on; as Dr. Asshurst remarks, "if the patient breathes freely he cannot be too rapidly etherised, and there is no danger, as in the case of chloroform, from the vapour being too concentrated." In some cases this condition is simply shown by a withdrawing of the head from the mouthpiece, this also indicating that it is the most suitable time to press on the influence. It is to be remembered that during the first few inhalations the patient should be allowed a little time to become accustomed to the odour of the ether; but if ether be exhibited by the inhaler, as I propose, no struggling or spasmodic stage can, in the generality of cases, be of inconvenience.

Sickness of stomach is said to succeed to etherisation more than to the use of chloroform; my experience with both leads me altogether to disagree. The precaution should be taken that no food be ingested within two or three hours at least. I am sure the instances will be rare, indeed, where sickness occurs, if this simple rule be adopted.

Another objection, if it can be called one, that has been suggested is that of the odour of ether from the breath being so persistent. I have not found it after a few hours. But even if it lasted a week, it could not have a feather's weight influence in the consideration of using an agent which has been shown to be "*the safest of all anæsthetics*," and than which, chloroform, which alone can be compared with it in efficacy, is "*eight times more dangerous.*"

I cannot avoid urging the question on the attention of the profession, when America, which has had a quarter of a century's experience with ether, prefers it as the *safest* agent, although, in my opinion, it has been hitherto but imperfectly used.

The use of the inhaler I have devised completely obviates all difficulties, and renders the use of ether, as an anæsthetic, applicable to all operations, whether large or small, and also applicable to all ages, with the incalculable advantage of offering the greatest security that can be given by any of the anæsthetics known at the present day.

As to the matter of cost, about 2 oz. of ether suffice (by the inhaler), whereas a half-pint is frequently used otherwise. The ether, if anhydrous, and S.G. of 720, may be made from methylated spirit. Care should be taken in all cases to ascertain its being correct, and of the purest quality.—*Dublin Journal of Medical Science, Nov.* 2, 1872, *p.* 360.

98.—NOTE ON THE ADMINISTRATION OF ETHER.

By John Couper, Esq., Surgeon to the London Hospital, and Assistant-Surgeon to the Royal London Ophthalmic Hospital.

At Moorfields from eight to twelve patients are anæsthetised during the few hours of each day devoted to operations; thus the time consumed by each administration is of some, although secondary, importance. A slow anæsthetic is hardly admissible. Ether has been used there since August in a large number of cases. No difficulty has been found in speedily producing perfect muscular quiescence. The time necessary for complete narcotism is about the same as with chloroform—certainly not longer.

A marked and invariable feature has been the absence of all disposition to syncope. There have been no sudden failures of pulse, with pallid lips, even under the most lavish use of the anæsthetic; on the contrary, complete muscular relaxation was generally associated with a flushed face and full pulse. A folded towel enclosing a piece of sponge has been the only inhaler used. Only when this is soaked with anhydrous ether is a vapour of adequate concentration obtained. The presence of even small percentages of water reduces the volatility of ether very considerably, and prevents a satisfactory result.

Without disparagement to less simple devices for administering a vapour of known strength, it may be asserted that the folded towel possesses great practical convenience, and has yet to be proved dangerous. By no other method can a vapour of adequate concentration be so readily obtained. Not only is there no danger in this lavish use of the anæsthetic, but narcotism is produced more quickly, and with less cerebral excitement, than is apt to result from too weak a dose at the outset. If the latter fault be committed, the patient becomes noisy and violent, and the vessels of his face and head become turgid—a condition unfavourable to many operations. On the other hand, by an adequate dose, narcotism, without excitement, is produced, and can then be easily maintained for an indefinite period by a less concentrated vapour.

The sole objection to this mode of administration is the overpowering sense of impending suffocation, apt to be produced by the first contact of the vapour with the air passages. While my experience accords with that of Dr. Joy Jeffries as to the necessity for a strong dose at the outset, I do not believe with him that a forcible administration in spite of the patient's struggles, is a desirable or necessary practice. By a little management in the case of adults, it may generally be dispensed with. They often take it without struggling, when forewarned that a few deep inhalations resolutely taken dispel the sense of choking. When voluntary efforts fail to overcome spasm of glottis provoked by the vapour, it is best to relieve them by momentarily raising the towel from the face, and allowing one full inspiration of unmixed air before panic takes possession of them. By this manœuvre the spasm instantly disappears, and does not return when a concentrated vapour is again inhaled. It should be remembered that the struggling occurs before the ether has had time to affect the brain, and the cause of it—the irritation of the air passages—disappears at the very commencement of anæsthesia, after one or two full inhalations of vapour. Occasionally, no doubt, an adult is entirely wanting in self-command, and fails to co-operate in the administration. A little force may then be needed, but should not be prolonged more than a few seconds. After a few inhalations of strong vapour, a breath or two of unmixed air should be given, and the inhalation then resumed, probably without resistance from the patient.

Children must be narcotised forcibly, but their struggles are neither so violent nor so distressing to bystanders as those of adults. Ether does not blister even after prolonged contact with the skin, and in this respect is altogether different from chloroform and methylene.—*British Medical Journal, Nov.* 30, 1872, *p.* 604.

99.—REPORT OF FIFTY CASES OF ETHER ADMINISTRATION IN THE GENERAL INFIRMARY AT LEEDS.

By A. F. McGill, Esq., Resident Medical Officer.

Ether has been used in the Leeds General Infirmary in all cases in which it has been necessary to produce anæsthesia since November 8th. This report refers to the first fifty cases, and extends over a period of three weeks, from November 8th to November 30th. In the first eleven cases, the ether was given on a small sponge, covered by a folded towel. This method was found to be inconvenient. In the other cases, a large conical hollow sponge, covered with waterproof jaconette, has been used. The drug employed is the best methylated sulphuric ether: about one ounce is placed in the sponge, which is held tightly over the face, so as to exclude air as much as possible.

Of the fifty cases, nineteen were children under fifteen years of age; thirty-one were adults above that age. The average time required to produce anæsthesia was, in children, one minute and a half; in adults, two and a third minutes. The quantity of ether required was, in children, an ounce and two-thirds; in adults, two ounces and one-third. The average time for which the anæsthesia was kept up was, in children, seven minutes; in adults, twelve minutes; the quantities used being two and a half ounces and four and a half ounces respectively. Vomiting occurred in thirteen cases; in six children, and in seven adults. The following cases exemplify the use of ether.

I. A woman aged 62, had ovariotomy performed by Mr. Wheelhouse. Three minutes after the commencement of administration, three ounces having been used, she was insensible, and the operation was commenced. Perfect anæsthesia was kept up for thirty-three minutes. She never vomited after the operation, and made a speedy recovery.

II. Mr. Jessop performed the operation of lumbar colotomy on a woman aged 25. Three ounces of ether produced complete anæsthesia in three minutes. The operation was one of extreme difficulty, owing to the small size of the colon, and lasted sixty minutes, eleven and a half ounces of ether being used. No vomiting occurred, and the patient recovered without a bad symptom.

III. A woman aged 50 came to the Infirmary with a dislocation of the humerus into the axilla. This could not be reduced, owing to the rigid condition of the muscles. She was placed under the influence of ether, and within two and a half minutes the muscles were relaxed and the dislocation reduced.

Cases like the above show that ether can be used with advantage in severe and long operations, and also when it is necessary to produce muscular relaxation.

The following are the chief ways in which the action of ether differs from that of chloroform.

1. The heart's action is stimulated and the pulse improved, there being no tendency towards that most dangerous of all symptoms, cardiac syncope.

2. The respiration is laboured, and the blood imperfectly aërated, as shown by its becoming dark, as though venous, in the arteries.

3. Vomiting is less frequent, and not so troublesome: in only one case out of the thirteen in which it occurred was it at all persistent.

4. Struggling during administration is of frequent occurrence.

5. Restlessness and noisiness after the operation, lasting for some hours, are not unfrequent.

6. Patients who have had both ether and chloroform, much prefer the latter.

In conclusion, I may add that the advantages and disadvantages of ether and chloroform seem to be so nearly balanced, that the question as to which should be used appears to be one of safety only. If further experience prove that ether is the safer, then it should be adopted; but if this be not proved, then I should prefer chloroform, as being both cheaper and easier to administer.—*British Medical Journal, Jan. 4, 1873, p. 9.*

100.—REPORT ON THE ADMINISTRATION OF ETHER AS AN ANÆSTHETIC IN HOSPITALS.

Middlesex Hospital.—Mr. G. Everitt Norton, chloroformist to the hospital, writes:—For the past three months, ether has been generally administered at this hospital with satisfactory results. The longest time during which its inhalation has been continued was an hour, in a case of colotomy. The patient did not experience any inconvenience from the anæsthetic, and had no sickness. It is administered at this hospital mixed with air, passed over a vapour of ether at a temperature of about 70 deg. Patients find its inhalation by this method far more pleasant than by the ordinary methods. There appears to be by this plan less struggling, and the patients rapidly become insensible. The average time required for an adult is from three to four minutes, and for a child from one to two minutes. I administered ether in a case of ovariotomy last week. The patient was fully under its influence in three minutes and a half; the operation lasted thirty-five minutes, and during that time, she only required two ounces and a half. Her pulse became very weak during the operation, and at times almost imperceptible. She was slightly sick about half an hour after the operation, and once again seventeen hours afterwards. She is doing well. The sickness after ether is not more frequent than after chloroform; and, when it does occur, it does not continue so long, but is more severe while it does last. Ether also sometimes causes great excitement a few hours after the operation, which, of course, in some cases—as delicate eye-operations—is a thing to be avoided. A little boy was operated upon at mid-day for hip-joint disease, ether being administered. In the evening, he became so excited, that it was with difficulty he was kept lying down in bed. The rigidity with ether is not more marked than with chloroform, and is soon overcome by pushing the ether anæsthesia. The pulse varies a great deal during the administration of ether; in some cases it has been noticed as high as 140 in a minute, in others as low as 40. In some cases, during the inhalation of ether, there is an excessive secretion of saliva. Patients who have inhaled both chloroform and ether give the preference to chloroform as being far more agreeable. Consciousness does not return more quickly after ether than after chloroform. In conclusion, ether does not appear to have any advantages over chloroform, unless it be proved to be safer. Patients often complain of the taste of the ether on the day following the operation, and generally smell strongly of it. I have now fixed to the expiratory valve of the inhaler which I use a long India-rubber tube, which conveys the expired ether to the floor. This prevents the operator and assistants from being annoyed by the vapour.

London Hospital.—Mr. Lewis Mackenzie, house-surgeon, writes:—Our four surgeons almost universally use ether now: Mr. Hutchinson makes the exception in the case of old people, for whom he prefers chloroform. Each house-surgeon has an "anæsthetic record"—that is, a book in which he enters the particulars of every case in which anæsthesia is produced, &c. Ether has been administered sixty or eighty times at this hospital with perfect success. The violence of the "excitement stages" has in certain cases been rather deleterious—as, for instance, to-day, in a case of compound comminuted fracture of the lower jaw, the muscular spasm and talking, during the recovery from anæsthesia after administration of ether, completely shifted all the apparatus, allowing the fragments to get out of position. In such a case, Mr. Hutchinson remarked, chloroform would be judiciously used to keep up a state of anæsthesia originally produced by ether. I have as yet seen no particularly good inhaler for ether. We generally use a towel, in form of a cone, with a sponge. I am not in a position to say anything definite about the circulation, respiration, vomiting, &c., at present.

University College Hospital.—Mr. Walter Rigden, resident medical officer, writes as follows:—I have as yet only administered ether twelve times, and consequently have not yet been able to form an opinion of much value. The plan of administration has been that recommended by Dr. Joy Jeffries, *i.e.*, a towel folded into a cone and a piece of lint about eight inches square screwed up and put into the inside. I then pour on to the lint as much ether as I can get it to absorb without soaking through to the towel—generally about an ounce and a half—and tell the patient to breathe deeply. In about four or five minutes he has generally been sufficiently under for slight operations, such as opening abscesses, or examining sinuses; in from seven to ten minutes he has generally been thoroughly under for any operation. Patients have inhaled it well; there has been no more struggling than usually occurs with chloroform; it generally sets up more or less bronchial irritation and flow of saliva, and this may last a quarter of an hour after the operation, but this is not usual. The patients have not complained of more unpleasant sensations either during the administration or afterwards than are often noticed with chloroform inhalation. In three cases out of the twelve there was vomiting afterwards, and in these it was not protracted; one of the other patients felt nausea for an hour or two afterwards, but did not vomit, and two suffered from severe headache for twenty-four hours after the operation. I have used three or four ounces of ether for operations of fifteen or twenty minutes' duration; and in one operation for lacerated perinæum, which lasted seven minutes under an hour, I kept the patient well under with seven-and-a-half ounces. I have not noticed the ether to escape into the surrounding air to any disagreeable extent. From my limited experience, I think that ether answers very well: the chief objection seems to be, that one has to use much more of it than one would of chloroform.—*British Medical Journal, Jan.* 11, 1873, *p.* 35.

101.—STAGES OF ANÆSTHESIA.

By Dr. Kidd, Dublin.

Practical surgeons are familiar with three, if not four "stages" in the process or progress of rendering patients insensible to pain for surgical operations. Two stages of excitement, probably cerebral and spinal; two stages cerebral and ganglionic, evidently depressant. Thus, an otherwise quiet man will suddenly burst with the strength of six men out of bed in the earlier excitement stage; a vigorously acting uterus will as suddenly lose all action in the later or third stage. These stages, no doubt, follow one another insensibly and quickly where the anæsthetic is continued in the ordinary doses. One sees them under all anæsthetics and under every variety of inhaler.

Three essential stages—and as to their progression quickly or slowly, will the anæsthetist measure the quantity of the ether or chloroform necessary. Some subjects are struck down almost at once, others, as hysteric women, resisting it. Three stages—one of excitation, the heart oscillating, as it were, in a balance uncertain; a puzzle to outsiders, but to the man of skill only following the changes of the respiration regularised by it, especially as through the second into the third stage the circulation becomes slow, and pulse may even disappear, and is slow too as a consequence; but there is no fear if the man is not trusting to mechanic stop watches or inhalers.

It is well to remember that no two patients inhale chloroform or ether, or nitrous-oxide gas alike; each case is a half-physiological, half-practical little problem by itself, where the true expert is watching these varying changes of respiration, face expression—natural progression of the stages. This healthy oscillating of the heart and lungs, with an eye-out for sickness and vomiting; nor will he neglect these, trusting to something mechanical, like the bow of Ulysses in the classics, so like the chloroform balloons, double valves, bellows, &c., that no one else can bend or make use of except the instrument-maker himself.

102.—ON THE CHOICE OF ANÆSTHETICS.

By Jonathan Hutchinson, Esq., Senior Surgeon to the London Hospital; Surgeon to the Moorfields Ophthalmic Hospital, and to the Hospital for Skin Diseases.

[Mr. Hutchinson commences this paper by relating a case he had had in private practice, in which death from hemorrhagic apoplexy occurred ten hours after an operation for the removal of a cancerous sub-maxillary gland. The patient was 84 years of age, and never spoke coherently after the operation. After commenting on this case, the author continues:]

In reference to the general question as to the choice of anæsthetics, I may say that I am strongly of opinion that we ought, with the exception of a few cases, to allow ether to supersede chloroform. I have now employed ether in so many cases, both at this hospital, at Moorfields, and in private practice, that I am justified in forming an opinion as to its general applicability. It appears to me that you can do anything with it that you can do with chloroform. It is not quite so rapid in its action, and, on the whole, not quite so convenient to use. Patients complain also more of its disagreeable consequences in the way of headache, &c., but these are matters really of comparatively little importance in the majority of operation cases. Now and then it happens that a patient after ether struggles and becomes violent in the stage preceding the full return to consciousness, and in fear of this result I have never yet given it for extraction of cataract; nor do I ever intend to do so, for, as our patients in these operations are always elderly, they are those who bear chloroform well and ether ill. I do not think that at Moorfields we have ever lost by chloroform a patient in whom it was given for the extraction of cataract. Those who have died, and there have been several (none under my own care), have almost always been young patients, and generally, I think, for strabismus operations. Then, again, for young infants, in whom chloroform seems to be exceptionally safe, I think I shall continue to prefer it. For such operations as hare-lip, for instance, chloroform is more convenient.

At Moorfields we have for long been in the habit of using methylene. It is certainly more rapid in its action than chloroform, but I have never been sufficiently impressed, either with its superior convenience or its additional safety, to be induced to employ it either in private practice or here. I have seen several cases in which alarming symptoms occurred during its use, but never an actual death.

Our one reason for abandoning chloroform is its danger. If we could get rid of this, it would certainly stand without rival. My own experience of chloroform has been very considerable, and for a great variety of cases. I have had but a single death in my own practice, but I have been the witness of several in the practice of others. I have also had amongst my own patients several very alarming occurrences, in which it was with the greatest difficulty that death was prevented. In the case of a girl at Reigate, in whom apparent death occurred during excision of the knee, we had to perform artificial respiration for at least ten minutes before any signs of reanimation occurred. In another case at the London Hospital, in an amputation of the thigh, the period during which I thought the patient dead was almost as long. In both these instances, death-like pallor of face and absence of pulse (cardiac syncope) were the alarming symptoms; and in both artificial respiration, irritation of the surface, and the use of brandy enemata, were the means resorted to. In addition to them, I have had many cases in which the pulse failed temporarily, and in which we had to begin artificial respiration in order to ward off the more dangerous condition. During the last four or five years, I think I have had fewer alarming cases of this kind than formerly; and I attribute this in part to the skill and care of those who have given chloroform for me, and in part to the fact that I have been very particular as to the administration of stimulants (brandy) before using the anæsthetic. I have never of late used chloroform without knowing that my patient had fasted some hours, and had taken a dose of brandy within the last half-hour. These seem to me the two principal points; but, if you insist upon the one (the fasting), it is additionally important that you attend to the other. In a fasting and exhausted state of the system, we have the condition in which cardiac syncope is the most likely to occur.

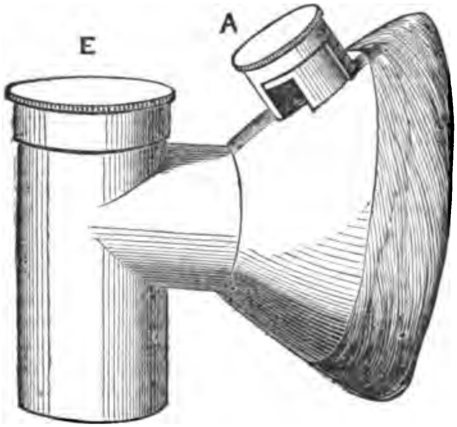
The case which I have alluded to as the only one in which I have had death actually occur, was that of a man much exhausted by a month's suppuration from a compound fracture with his elbow-joint. I saw that he was very nervous when he was put on the operating table, and I ought to have given him brandy before proceeding. His heart failed within five minutes of the commencement of the inhalation, and before I had begun the operation. If your patient is unusually feeble, I do not think it well to do an operation early in the morning—*i.e.*, before the first meal. Indeed, in all cases in which an early appointment is made, it is best to tell the patient to take some fluid food, coffee, beef-tea, or milk, about two hours before the time fixed. Under most other circumstances I should insist upon a four hours' fast, with the double object of preventing the danger which attends vomiting during the anæsthesia, and the inconvenience and suffering which it sometimes produces afterwards. As regards the quantity of brandy to be given, that should be in proportion to the patient's age and habits, bearing in mind that it is better to give too much than too little. It is given in order to act as what is called "a diffusible stimulant;" which, I suppose, means that it is to keep the blood vessels well open and thus facilitate and sustain the circulation. Ether is an agent of a similar class, and hence its freedom from risk as compared with chloroform. Opium also acts in the same way, and I have no doubt that the administration of a good dose of opium, or the inhalation of ether for a few minutes before using chloroform would, either of them, make the latter much more safe.

There is just one other little matter to which I wish to advert. You may have observed that in cases in which the anæsthetic is used in order that the actual cautery may be applied to some part of the face, as we not unfrequently do for lupus and rodent carcinoma, I always give chloroform. Sometimes we give ether for a few minutes first, but we always take care that the vapour has had time to pass away before the cautery is brought near to the face. The reason for this is obvious; the vapour of ether is very inflammable, and a little thoughtlessness might easily lead to a terrible accident. It may be well also, for the same reason, to avoid employing ether by candle-light.—*British Medical Journal, March* 8, 1873, *p.* 247.

108.—DESCRIPTION AND ILLUSTRATION OF AN ETHER INHALER, WITH OBSERVATIONS UPON A MIXTURE OF CHLOROFORM AND SPIRIT OF WINE FOR PRODUCING ANÆSTHESIA.

By B. Wills Richardson, Esq., Surgeon to the Adelaide Hospital, Dublin.

The relative safety of chloroform and ether as anæsthetics having been recently brought before the profession in Dublin by my friend, Mr. John Morgan, at the first meeting of the Surgical Society of Ireland for the present Session, it appeared to me that it would be advisable to have constructed a simple and moderate-priced inhaler for etherization in hospital practice. This inhaler (see Fig.) has been designed as a substitute for the towel and sponge, in the use of which there is much waste of ether, a matter, in hospital economy, that may be of some importance.



A.—Air opening. The amount of air to be admitted to the face-piece is regulated by a sliding cap, having an opening of the same size as that in the tube on which it turns. At the beginning of the inhalation, the inner opening may be fully exposed and gradually covered, by rotating the cap according as the air passages of the patient become accustomed to the vapour. E.—Ether box, to hold a little more than an ounce and a half of ether. This box communicates with the face-piece by means of a tube an inch in length and one inch and a half in diameter, the ether box opening of the tube being two-thirds closed by a fixed diaphragm. This prevents the fluid ether from passing into the tube when the patient is in the horizontal position. The face-piece opening of the tube has a diameter of one inch. The tube itself, in order to increase the evaporating surface, should be nearly filled with soft cotton candle-wick, having, when in use, one end submerged in the fluid ether. The inhaler may be made of silvered copper or block tin; but the face-piece margin should be formed of flexible metal, and covered with morocco leather.

Although I have not myself adopted ether to the exclusion of chloroform, having had most satisfactory anæsthetic results from the use of a mixture of chloroform and spirit of wine, still I think it is our bounden duty, the relative danger of chloroform over ether having been so prominently raised, to test the point, that we may aid in the attempt to solve this deeply important question.

It is almost needless to write, that a question requiring such accurate and unprejudiced observation for its solution as that of the relative anæsthetic safety of chloroform and ether cannot be settled in a day.

To satisfy the logical mind it would be necessary to administer the two agents to an equally large number of persons, and to the same class of persons, having either injuries or diseases similar in their nature. As this, however, would be impossible, we can only arrive at an approximate estimate of the relative safety of these anæsthetics.

Whether or not ether is destined to recover its long-lost prestige in the United Kingdom remains, therefore, to be proved. At all events, Mr. Morgan deserves credit for the talent and energy he has applied to the solution of this important, and if I might venture to call it such, biological question.

According to Snow, about a fluid ounce of ether is usually inhaled by an adult patient in becoming insensible; but in order that the administrator may not, if possible, have to refill the box, it is made of a size sufficient that an ounce and a half of ether when in the box will fill it to near the upper margin of the diaphragm. It is necessary, according to Snow, that the inhalation should commence, as in the case of chloroform, with the expiratory valve of the face-piece of his inhaler turned to one side, that the vapour should be admitted to the air passages by degrees, to avoid the irritation that would arise from suddenly inspiring any considerable quantity of the vapour. In this inhaler the admission of air is regulated by the sliding or rotating cap A. When the inhalation has been in progress for one to two minutes, the patient should be made to breathe nearly altogether the pure vapour, which is effected by rotation of the cap A. If there be no peculiar susceptibility against ether narcosis, the latter will be complete in a few minutes.

The quantity of ether my friend Mr. Morgan pours into his ingeniously-constructed inhaler is from one and a half to two ounces. For the description of this excellent apparatus, and for much interesting matter on ether as an anæsthetic, I must refer the reader to his very instructive monograph on the subject.

Although deaths, it must be conceded, have resulted from the inhalation of ether, I will, notwithstanding, reproduce here the following observations of Snow regarding the safety of ether, as an inducement for the trial of ether by those who are not disposed to do so in consequence of their having had good luck in the use of chloroform.

"I believe," he has recorded, "that ether is altogether incapable of causing the sudden death, by paralysis of the heart, which has caused the accidents which have happened during the administration of chloroform. I have not been able to kill an animal in that manner with ether, even when I have made it boil, and administered it quite pure." . . . . "I hold it, therefore, to to be almost impossible that a death from this agent can occur in the hands of a medical man who is applying it with ordinary intelligence and attention."

When we compare these observations with the information collected by Mr. Morgan regarding the safe anæsthetic properties of ether, we feel constrained to observe that he would be prejudiced indeed who neglected to test the relative anæsthetic safety of chloroform and this agent.

I confess that I am myself in favour of a mixture of equal parts of chloroform and spirit of wine for producing anæsthesia, and, therefore, it is the comparative safety of this fluid I purpose testing against the ether. This mixture is best administered with either a piece of lint, a handkerchief, or with Skinner's apparatus, for the following reasons mentioned by Snow:—"Whenever chloroform is administered from a handkerchief or sponge, it should be diluted with one or two parts, by measure, of spirit of wine or eau-de-Cologne. In this way, the convenience of the handkerchief or sponge can be taken advantage of without the danger. Very little of the spirit is inhaled, as the greater part remains behind after the chloroform has evaporated; but it acts by lowering the elastic force of the vapour of chloroform, and diminishing the amount of vapour which is given off from the handkerchief or sponge, just as diluting a strong solution of ammonia with additional water diminishes the amount of the volatile alkali, which escapes as gas. One hundred cubic inches of air are capable of taking up fourteen cubic inches of vapour, at 60°, from pure chloroform, and becoming expanded to 114 cubic inches; but when the chloroform is diluted with an equal volume of alcohol, it will only yield eight cubic inches of vapour to 100 of air. In passing over a sponge or handkerchief, the air would take up less than this, usually four or five per cent., which is a quantity sufficient to cause insensibilty in four or five minutes, without the risk of sudden accident."

I do not recollect that I have seen this mixture produce insensibility in so short a time as Snow mentions.

In conclusion, may I observe, that in the present medico-legal aspect of the relative safety of ether over chloroform for the production of anæsthesia, it would not, perhaps, be injudicious upon the part of the administrator to permit the patient to select the anæsthetic.—*Dublin Journal of Medical Science, March*, 1873, *p.* 227.

104.—NOURSE'S ETHER INHALER.

Mr. Nourse of Brighton has forwarded a cheap and very simple inhaler for ether and chloroform. It consists of a cone of cardboard two or three inches in depth, made so as to cover the mouth and nose with comfort. A flat sponge is inserted into and covers the upper end of the cone. This is kept in its place by a few cross stitches with thread.

As an ether inhaler it possesses the advantages of cleanliness, simplicity, and cheapness. The sponge, however, does not effectually close the upper end, and accordingly the ether evaporates rather freely from its upper surface, and is also dispersed by the violence of expiration, thereby causing waste of the anæsthetic and inconvenience to the administrator, and inordinately filling the room with ether.

As a chloroform inhaler it would be highly dangerous.—*British Medical Journal, Feb.* 22, 1873, *p.* 200.

105.—ETHER *versus* CHLOROFORM.

By J. T. Clover, Esq.

In discussing the merits of ether and chloroform as anæsthetics, there are two questions which ought to be considered separately. 1. Which is the less likely to cause death? 2. Which leaves the patient in the more favourable condition afterwards?

As to the safety of chloroform, my experience of it during the last twelve years, since I adopted the plan of measuring the chloroform and air, so as to insure that there shall not be more than three minims and a half in each hundred inches of air, has been so favourable that I have never felt the need of another anæsthetic on the ground of safety. I have administered it without rejecting a single case as unfit for it, and to many persons whose heart and lungs were in a morbid state. I have never had a death from it or any other anæsthetic.

I have experimented with stronger doses, and found that the tendency to produce cardiac syncope increased with the dose. This tendency of chloroform to depress the action of the heart has not been sufficiently recognised; and many surgeons, regarding failure of respiration as the danger to be chiefly watched for, do not habitually keep the pulse under observation.

A stronger dose than I have mentioned may be inhaled safely whilst respiration is carried on regularly; but when, as often happens, the pungency of the vapour induces the patient to hold his breath and then breathe very freely, a state of rigidity sets in. This condition, when the patient after a full inspiration holds his breath and strains, is one of the greatest interest. In any case, the first effect is to make chloroform enter the blood more freely, for blood will take up more chloroform in proportion to the atmospheric pressure, just as water does the carbonic acid in the making of soda-water. If the proportion of chloroform in the air-cells be small, it soon becomes so reduced by absorption into the blood, that after twenty or twenty-five seconds, the blood passing through the lungs gets so little that the patient may be less narcotised then when the rigidity commenced. When, however, the quantity of chloroform is above four per cent., the heart soon begins to fail, and as the blood now circulates more slowly through the lungs, another condition favourable to the absorption of chloroform is induced. If chloroform be administered without due means to prevent a large dose from being given, and without watching the pulse, I have no doubt that it is more dangerous than ether.

As to the question whether ether or chloroform leaves the patient in the better condition, I should say that a patient kept quiet during an operation for half an hour would recover better from chloroform than from ether. The point may be considered as doubtful, and perhaps the after-effects of ether would be less unpleasant if we could contrive a better way of administering it. As it is usually given, the patient gets very little fresh air, and carbonic acid does not escape so freely as it ought. I have lately been giving ether by a modification of my chloroform apparatus, which supplies the patient with air charged with ether. It consists of an oval piece of glass as large as the face, and set in a frame which keeps it a little distance from it. The sides are closed in with a curtain all round, and into this chamber air and ether are supplied in a slow current. I find that this produces less coughing and less opposition than other ways of giving it. The patient's face can be seen. The eye can be examined by pushing the curtain in front of the finger and raising the eyelid. As I hope to write shortly a further description of this apparatus, I will not further occupy space now.—*British Medical Journal, Nov.* 9, 1872, *p.* 534.

106.—ON ANÆSTHETICS.

By Dr. Thomas Jones, Assistant-Physician to Victoria Hospital for Sick Children, formerly Resident Medical Officer and Administrator of Anæsthetics to St. George's Hospital.

In a paper read on this subject before St. George's Hospital Medical Society in

1863, I observed that the result of my experience to that time tended to show (1) that ether caused during the first stage more cerebral excitement than chloroform; (2) that it produced a greater degree of anæsthesia before the consciousness was completely abolished; (3) that during the stage of very complete unconsciousness, the reflex function of the cerebro-spinal centres was not abolished to the same degree as under chloroform; (4) that it stimulates instead of depressing the heart.

My subsequent experience confirms, in the main, these conclusions. Ether, unlike chloroform, would seem to exert no paralysing influence on the heart, carried to the extent necessary for the performance of operations. In the paper referred to, I related two cases in which ether was administered with good effect after chloroform had been tried and found to produce dangerous symptoms.

Dr. Snow states (On Anæsthetics, p. 362) that "ether is altogether incapable of causing sudden death by paralysis of the heart, which has caused the accidents which have happened during the administration of chloroform. I have not been able to kill an animal in that manner with ether even when I have made it boil, and administered the vapour almost pure. The heart has continued to beat after the natural breathing has ceased, even when the vapour has been exhibited without air. . . . I hold it, therefore, to be almost impossible that a death from this agent can occur in the hands of a medical man who is applying it with ordinary intelligence and attention." When this passage is taken in connection with the fact that Dr. Snow records in the same work no fewer than fifty fatal cases from chloroform, it is very wonderful that he should still persevere in the use of chloroform, especially when we find he observes (*op. cit.*) that he "usually rendered adult patients insensible in four or five minutes, and children in two or three," and that he "never failed to make the patient insensible in any one instance in which ether was administered." Hence, ether being in his hands perfectly successful and manageable, I cannot help agreeing with the opinion advanced in the leading article in this Journal of the 16th instant, that he, like every one else, was considerably influenced in the choice of the anæsthetic which he used by the energetic and uncompromising advocacy of the discoverer of chloroform.

I think the disadvantages of ether over chloroform are really very few and trivial. I find that some prefer the flavour of ether vapour to that of chloroform. Its pungency, when inhaled, only lasts a few seconds, and not at all in some cases, when properly administered. As to the question of cost, I also think this objection has been exaggerated. Methylated washed ether (which answers all purposes quite as well) can be bought for half-a-crown a pound. If the anæsthetic be given rapidly and unsparingly at the commencement, I do not think the dose for each patient should cost more than sixpence—so that, in fact, the cost is not much greater than that of chloroform.

With reference to the mode of administration, I think the plan recommended by our American friends is as good as any—namely, a thick towel, in half-dozen folds arranged in the form of a cone. Care should be taken that its base should be large enough to take in the chin and the nose—its shape such as to fit the face accurately. A small sponge should be placed inside, which should be squeezed out of warm water after each case to prevent its becoming so cold as to interfere with the evaporation of the ether. Mr. Warrington Haward's apparatus, described in this Journal on the 2nd inst., is also a convenient method of administering it, and answers very well. But I find that the oiled silk, which forms its external layer, is an objection, because it interferes with the conduction of heat from the hand into the interior of the cone. In a cone covered with the oiled silk, the interior becomes so reduced in temperature that the evaporation of the ether is considerably checked.

Thinking that an inhaler would effect, amongst other advantages, considerable saving of the ether, I have had for some time my attention directed to this point, but have not as yet succeeded in suggesting any improvement upon the one adopted by Dr. Snow.

The Combination of Chloroform and Ether.—My experience, in the main, confirms the opinion held by Dr. Snow, that the combination of these two liquids combines the undesirable qualities of both. When the two agents are combined in their liquid state, one never knows what one is about. I should not have considered it necessary to allude to this point, had I not seen a communication from Dr. Edis in the Journal of November 16th, still advocating this method—one which, I thought, had been given up some time since. I have, however, been in the habit for some years past of administering the vapours of these two agents to the same patient with considerable advantage. I begin with chloroform; but as soon as the pulse shows signs of failure, I commence the administration of ether, and continue its use until the pulse is restored, or as long as the patient remains quiet enough for the performance of the operation. In this manner, I believe, the cases of avoidable deaths from cardiac failure resulting from chloroform might be averted.

Nitrous Oxide.—When I consider the safety, ready applicability, and the pleasantness of this agent, together with the success attending it, I confess I am surprised that surgeons do not adopt it more generally than they do for the minor operations requiring but few minutes in their performance. I have succeeded in keeping the patients under its influence for eight or ten minutes by its reapplication from time to time. I think that for some cases of operations about the eye its use would be invaluable, seeing that it produces no sickness.—*British Medical Journal, Nov.* 30, 1872, *p.* 603.

107.—ON THE TREATMENT OF CHLOROFORM POISONING.

By Dr. G. Vivian Poore, Lecturer on Medical Jurisprudence at Charing-Cross Hospital.

[If the case seems one of a really serious nature.]

At once commence artificial respiration after Silvester's method. Get an assistant to hold the tongue well forward, and begin the artificial respiration with expiration, your first object being to empty the lungs of the chloroform vapour. Let your patient lie flat upon his back, and take up your position directly behind him. Then seize the patient's arms just at the elbows, press them firmly against the sides of the thorax, and then slowly and gradually and firmly draw them directly above the patient's head. Each time that this is done properly the noise of inspiration will be heard. Above all things, do not hurry, and do not perform the act of artificial respiration too quickly, or you may thereby defeat your object. About fifteen times in a minute is quite enough. When speaking of the importance of not hurrying, Dr. Marshall Hall says: "I removed larynx and windpipe, and attached the nozzle of the syringe to the lower part of the latter; on drawing up the piston the chordæ vocales were seen to be drawn together whenever the piston was moved with some degree of rapidity, *and all ingress of air into the windpipe utterly prevented.*" The conclusion which we must draw from this experiment is, that if you attempt to make air pass with undue rapidity through the trachea, you defeat your object.

Having got artificial respiration fairly started, send the nurse for a hot bottle, and one of the assistants for Stöhrer's galvanic battery, and if there should be any more bystanders bid them promote circulation by friction of the legs. When the hot bottle arrives place it between his legs, being careful not to scald him, but do not for a moment relax your efforts at artificial respiration. On the arrival of Stöhrer's battery proceed to galvanise the phrenic nerve, and so help inspiration by causing the diaphragm to descend. Place one rheophore just at the point where the omo-hyoid muscle passes beneath the sterno-mastoid at the anterior part of the posterior triangle of the neck. Have your rheophore well moistened, and press it firmly down in this situation, then apply the other rheophore to the lateral region of the thorax in the sixth or seventh interspace. This will cause a steady descent of the diaphragm. After five or six seconds break contact again. Then, after a slight interval, make contact, and so on. Each contact of the rheophore will cause descent of the diaphragm and consequent inspiration. There are two things to be guarded against; one is not to use too strong a current, and the other is not to continue the application for too long a time. You must cause the diaphragm to descend so as to imitate natural respiration as closely as possible. Remember it is the phrenic nerve and the diaphragm that you want to galvanise. If you attempt to galvanise the pneumogastric nerve and the heart, you will only be adding another cause of death to the one with which you are already grappling; and, for the purpose of avoiding this, I advise that the rheophore should be applied to the lateral, and not the sternal, region of the thorax. I see no reason why galvanism of the diaphragm and Silvester's method should not be employed simultaneously. In this case you would apply the rheophore to the diaphragm at the time at which the arms are drawn above the head, and you would break contact while the elbows are being pressed against the side. If these methods succeed (as they invariably do succeed) in causing inspiration and expiration, you must continue perseveringly to use them. Admit lots of fresh air, at the same time keeping your patient warm with a blanket and a hot bottle, and endeavouring to promote circulation by friction of the limbs. These efforts must not be relaxed for at least an hour and a half, for we have the evidence of successful cases to show that up to this time there is hope of recovery. In resuscitation from an overdose of chloroform, as well as in resuscitation from drowning, the attendants should bear in mind the admirable motto chosen by the Royal Humane Society, *Lateat scintillula forsan.*

Artificial respiration is undoubtedly the measure *par excellence* on which we should rely. If the above modes of inducing it do not succeed, a catheter may be passed into the larynx, and inflation of the lungs affected through it. Brandy enemata, flipping with a towel, and the application of ammonia to the nose, are not likely to be of much use if artificial respiration does not answer, but they may all be of some service if the patient only partially rouses, and shows signs of relapsing again.

In those cases which die suddenly, apparently from paralysis of the heart, Dr. Holms, of Chicago, recommends that the patient should be placed with his head downwards, on an inclined plane of about forty degrees.

Patients who are going to take chloroform should be warned not to take any solid food for some hours previously, so as to lessen the chance of vomiting. On the other hand, we must be careful that the patient is not exhausted from want of food at the time of the operation. If the patient is to undergo an operation at 2 p.m., I usually direct him to eat a good substantial breakfast at 8 a.m., and then at 12 o'clock to take a small basin of soup and a glass of sherry. You must not allow him to take solid food for at least four hours before the operation, for the process of digestion seems to be delayed by the state of mental anxiety in which a person usually is before a surgical operation, and I have often been astonished at the great lumps of undigested meat which I have seen a patient vomit, although his last meal had been some hours before.

I have seen two nearly fatal cases of syncope under chloroform, due, I believe, to the exhausted condition of the patient. One was that of a little girl in delicate health, who, prior to being operated upon for squint, had been kept, in the middle of winter, for three hours in a cold waiting-room, she not having had any food since breakfast, the time then being 3.30 p.m. The other was that of a woman who was to have ovariotomy performed, and whose last meal, a very small one, had been five hours previous.

For the first ten or twelve hours after taking chloroform I think it is advisable to limit the patient to a liquid diet, so as to avoid all risk of inducing vomiting. It is a good plan, especially if the patient has been subjected to a severe operation, to give a dose of morphia, hypodermically or otherwise, before the effects of the chloroform have quite passed off. This will induce sleep for four or five hours, and the patient will awaken therefrom much refreshed.

Are there any conditions which contra-indicate the administration of chloroform? No. I believe that chloroform may be safely administered in all cases in which it is thought advisable to subject the patient to surgical interference. If he have a fatty heart I believe that his very safety (supposing an operation to be absolutely necessary) is immensely enhanced by the administration of chloroform, as without it the shock of the operation, acting upon a fatty heart, would very likely cause fatal syncope. Do not misunderstand me. I do not mean to say that the presence of a fatty heart does not increase the danger of chloroform, for I most decidedly think that it does do so, but I believe that if a patient with a fatty heart (a condition, by-the-by, very difficult to diagnose) is absolutely obliged to undergo a serious operation, it will be safer for him to take chloroform than not to do so. Moderate valvular disease of the heart or disease of the lungs does not increase the danger of chloroform. An intermittent pulse is no contra indication. Hysteria is a condition that causes inconvenience, but no danger. If a patient has an hysterical fit, as is not uncommon in the early stages of chloroform inhalation, continue the administration, and you will find the hysterical condition gradually subside. With epileptics the rule is different. The epileptic convulsion is an asphyxiating condition; if therefore a convulsion occur during chloroform-inhalation, stop till the fit has subsided, and then recommence.

Chloroform may be administered to patients of any age. Children, and even babies of a week old, take it very well, but of course great care is required in the administration.

In conclusion, I have only one piece of advice to offer, and that is that when administering chloroform you must give your patient your undivided attention, and you must not allow your thoughts to wander for an instant. You cannot give chloroform and attend to the operation as well. By doing so you jeopardise your patient's life. While under the influence of so powerful an agent as chloroform, the patient's condition varies almost momentarily, and requires almost momentary variations in the mode of administration of the anæsthetic. I believe that many of the victims of chloroform might have been still alive if the administrator had not attempted to do that which, in my opinion, nobody, except in extraordinary circumstances, is justified in doing—namely, the performing of the double office of surgeon and anæsthetist.—*Lancet, Dec.* 14, 1872, *p.* 847.

108.—CHLOROFORM IN "SHOCK."

By Dr. Kidd, Dublin.

If patients are suffering from "shock," the pulse improves. Some persons object to the word "shock," but there is none so expressive.

Surgeons differ a little, and the anæsthetist's opinion is expected as to whether chloroform should be given in "shock" or not; a wise precaution is to let the paleness, coldness of skin, oppressed breathing, nausea, &c., wear off a little first, after, some warm drink, with ammonia or brandy. The law of tolerance is very remarkable; much will depend how or whether the "shock" is from hemorrhage alone, or from nervous exhaustion, with fright and shattering of limbs; crush or burn of internal parts; or, syncope from reflex injury through inhibitory nerves. On battle fields in India, America, the Crimea, &c., chloroform has acted well in extreme "shocks."

One notices the effect of "shock," too, in large hospitals, especially in the manufacturing districts, from crush of machinery. The patient, in all instances, about to be operated on, no matter the exhilaration of nurses, war correspondents, dressers in the operating theatre, is always nervous, *more or less alarmed, and subdued in manner:* beginning to inhale, he often resists, says it is "choking him," or, he "never can stand it." Then it is well to wait fifteen or twenty seconds, or give the inhaler or lint a small dash of eau-de-Cologne to soften the feel of the chloroform.—*Irish Hospital Gazette, April* 24, 1873.

109.—CASE OF FATAL SUFFOCATION FROM NITROUS OXIDE GAS.

By the Editor of the Lancet.

A death from the inhalation of nitrous oxide gas occurred at Exeter on the afternoon of January 22nd of this year. The gas was administered by Mr. J. T. Browne Mason, a dentist in Exeter, for the purpose of securing the painless extraction of a large upper molar tooth from a patient under the care of Dr. Pattinson. As this is the first instance of a death from the gas that has been reported upon in this country, the facts are worthy of special record.

[The patient, Miss Wyndham, was a lady about thirty-eight years of age. She was in good health. Dr. Pattinson was present at the time. The gas was supplied from one of the ordinary iron jars into which it had been compressed. Gas from the same source had been administered to other patients without accident, so that its quality could not be impugned.]

At the beginning of the administration Miss Wyndham's pulse became rapid, and Dr. Pattinson thought less full, whereupon, the patient being quite sensible, the inhaler was taken away, and Mr. Mason made an attempt to extract the tooth; but she said she could not bear it, and begged to have the gas again. After a little delay, to enable Miss Wyndham to wash her mouth, the inhaler was reapplied. She took the gas in the usual way, without any symptoms to excite uneasiness. At the proper degree of insensibility the inhalation was stopped, and the tooth was extracted. In the operation, Mr. Mason was obliged to split the fangs and take them out separately. It was not until after the operation was completed that anything unusual happened, but immediately afterwards the face became livid, and the "features," it is said, "commenced to swell." Mr. Mason hastened to fetch Dr. Drake, who returned with him, and who found the lady still alive. She was sitting in a chair, in a half-reclined position, before an open window. Dr. Pattinson was by her side endeavoring to restore animation. Her features were livid and swollen, and she appeared to be quite unconscious. She breathed two or three times, and in a few moments after her pulse ceased to beat. All attempts to restore her were useless. Mr. Mason estimated that a volume of six gallons of gas had passed through her lungs.

These are the simple facts of this unfortunate case. They teach a serious lesson, as important as painful. Ruthlessly they destroy the infatuation that the administration of nitrous oxide gas is a harmless process—a process which any man, educated or uneducated, may carry out without danger of destroying life. This lesson must not be forgotten. From no agent have there been so many hairbreadth escapes from death as from this gas; and probably of late some persons every day have been brought within the minutest line of the danger to which Miss Wyndham succumbed. Indeed, a leading dentist told us but a few weeks since that he never operated until the breathing had temporarily ceased. But because through all this risk there have been, it is assumed, no fatal accidents, the administration has gone on in contempt of warning and of obvious danger.

The facts teach another lesson bearing on the cause of death. They show clearly that the assertion, so constantly made, that nitrous oxide gas does not affect the heart, is without foundation, for the first symptom presented by Miss Wyndham under the influence of the gas was rapidity of the pulse, with diminution of volume. But the immediate cause of death was clearly paralysis of respiration. There was no obstruction of the air passages, and the tongue was protruded from the mouth while she still respired; but, as Dr. Drake observed at the inquest, she was as powerless to breathe as though she had been immersed in water.

The most important lesson of all afforded by this painful case is, that we have yet a great deal to learn before we have perfected anæsthesia. Towards such learning the reintroduction of nitrous oxide has been a serious check. Nitrous oxide, indeed, is not an anæsthetic at all. A true anæsthetic is an agent which suspends common sensibility without, by any necessity, interfering with those organic processes on the continuance of which life depends. Nitrous oxide acts, not in this way, but by suspending for a brief period one of the most important of the organic processes—that of respiration itself. For the reason named, the insensibility produced by the gas is afforded during an interval of partial death. This interval, transient, doubtful, dangerous, may allow an operator time for a short operation, and, the agent away, the suspended function may return. Usually the suspended function does return, more frequently, in truth, than could be expected, but not always, as we now know by lamentable proof.

We cannot conclude this notice without expressing our cordial sympathy with Mr. Browne Mason. We believe the same catastrophe would have occurred whoever had been the administrator of the gas. We feel sure that he did everything that skill, prudence, foresight, and experience could suggest, and we rejoice that the jury were unanimous in their expression of the same sentiment.—*Lancet*, *Feb.* 1, 1873, *p.* 178.

110.—BISMUTH AS AN EXTERNAL APPLICATION IN SKIN DISEASES.

A correspondent writes:—"The value of bismuth in alleviating the intense itching and irritation which accompanies chronic eczema and other forms of skin disease is less known than it ought to be. In some obstinate cases, in which the inflamed condition of the derma is aggravated and kept up by the constant scratching and rubbing which the patient finds it impossible not to indulge in, I have found an ointment containing bismuth in the proportion of half a drachm of the subnitrate to the ounce of simple ointment, rubbed up with a little spirits of wine, and applied freely to the skin, give great relief. I was indebted to a work by Dr. McCall Anderson for the suggestion, and have certainly found the ointment far more efficacious as a soothing remedy than the benzoated zinc ointment more commonly used. Dr. McCall Anderson, in recommending bismuth, observes that the ointment must not be made with benzoated lard, or the reverse of a soothing effect may be produced."—*Med. T. and Gaz.*, *Jan.* 18, 1873, *p.* 71.

111.—ON THE USE AND ABUSE OF ATROPINE.

By R. Leibreich, Esq., Ophthalmic Surgeon to St. Thomas's Hospital.

[In this paper Mr. Leibreich relates the accumulated experience of his special branch of practice, and intends it especially for "those who, while actively engaged in general practice, have no opportunity of entering into the minute details of every department of such a comprehensive science." Speaking of the treatment of iritis, he observes that it is of the greatest importance to apply the atropine in proper quantity.]

Iritis.—In simple cases, a proper use of atropine would be sufficient, even without any other treatment, to produce a most favourable result. In more severe cases, even with the most energetic and careful treatment, a perfect result could not be obtained without a proper quantity of atropine.

How is this local application of atropine to be regulated? The strength of the solution is of little importance provided that it be not too weak. The necessary quantity is determined by the number of applications, or rather by the time during which we enable the cornea to absorb the atropine by keeping the conjunctival fluid saturated with the alkaloid.

Suppose that, for the sake of simplicity, we use in all cases a standard solution of four grains of atropine to the ounce of distilled water, and that each application consists in the instillation of one or two drops, unless the lachrymal secretion be very abundant, and then a little more should be used. Then the principal question to decide will be, how many times daily, and at what intervals to repeat this application? It makes, indeed, no difference at all whether we put in several drops or a large quantity of the solution at one time, and it always reckons as one application; on the contrary, two drops administered at an interval of five minutes or longer have a double effect, and are reckoned as two applications. Because in this way the conjunctival fluid has atropine mixed with it for a longer time, and, therefore, a larger quantity of the alkaloid penetrates the cornea to mix with the aqueous humour. As a rule for the number of such applications, we can only say that the pupil should be completely dilated as soon as possible, and that this dilatation must be maintained during the whole progress of the inflammation, and even for several weeks after it has abated. For this purpose, the quantity required for different cases varies so exceedingly that it is quite impossible to fix dogmatically a definite amount. To keep up this dilatation it is in one case sufficient to go on with one application daily, whilst in other cases three, four, or more applications are required, and only after several weeks it becomes possible to descend to one application daily, or the pupil contracts again and new adhesions are formed. Each case must be judged by itself, but, of course, experience in estimating the amount of inflammation assists one to an approximate conclusion.

In the great majority of cases we find no difficulty in carrying out the afore-mentioned plan of treatment. But iritis being such a very frequent disease, even the exceptional cases in which we meet with difficulties in applying atropine are still very numerous.

These difficulties depend upon the following conditions :—

Too great intensity of the inflammatory process.—Under these circumstances, atropine will sometimes not to be tolerated ; it increases the inflammation, and cannot produce the desired effect. Then it is necessary in the first place to give derivatives, and in strong individuals to reduce the intensity of the inflammation by bloodletting, and after that only to apply the atropine. The inflammatory symptoms become seldom so intense spontaneously, but they are sometimes increased to such an extent artificially, by wrong treatment. This happens especially in consequence of the application of cold, and the lotions generally used for conjunctivitis, such as nitrate of silver, sulphate of copper, sulphate of zinc, &c., which artificially increase the iritis.

To mistake iritis for conjunctivitis, which, I am sorry to say, too often happens, gives us an opportunity of observing this fact.

Excluding the afore-mentioned applications generally suffices in such cases to subdue the inflammation, and then the use of atropine becomes again possible.

Cold compresses are always to be avoided in all forms of iritis, and in all stages of the disease without exception. But warm applications are, not only in rheumatic cases, but also in other forms of iritis, very beneficial, and I decidedly prefer the application of dry warmth to warm poultices. I use myself generally warm wadding, and in other cases cotton wool saturated with aromatic oil, which is the same kind of thing as was formerly used.

Adhesions already completely organised.—In the majority of cases of iritis which come under our treatment, not quite at the commencement of the inflammation, we find the margin of the pupil here and there already fixed to the capsule. But at the commencement this adhesion is not so firm, and quickly yields to the action of the mydriatic, provided that it is used in sufficient quantity. But if already some time has expired, the separation cannot be made, especially if there are extensive adhesions, with thick exudations fixing it to the capsule ; nevertheless, we must give it a fair trial, the more so as it is very necessary to prevent further progress of the adhesions by the separation of that portion of the pupillary margin which still remains free from the capsule.

However, I differ from this rule, and from the generally accepted method of treatment of those relapses of iritis in which, after an insufficient use of atropine in earlier attacks, a complete or nearly complete adhesion of the margin of the pupil to the capsule has taken place. In such cases I renounce at once the application of atropine, as I know from a comparison of several cases that the remedy will not only not produce the desired effect, but that it will increase the intensity of the attack by its useless action upon the iris. Warmth, derivatives, and the usual constitutional treatment, will in such cases subdue the inflammation quicker without the use of atropine. If abundant exudation in the anterior chamber, effusion of blood, or hypopion exist, as may happen in cases of relapsing iritis, then, as was before mentioned, paracentesis should be employed. I cannot recommend an iridectomy in the acute stages of inflammation. This operation should be deferred to the intervening periods. And even where the urgency of the symptoms require it, we may perform a preliminary paracentesis, because, after the termination of the inflammation, the conditions for the iridectomy are more favourable.

Keratitis.—The important indications in the treatment of iritis, viz., to put out of action the sphincter of the pupil, and to remove the margin of the pupil away from the capsule, does not exist in the treatment of keratitis; but there still remains a very important property of atropine for the treatment of these diseases, viz., to diminish the sensibility of the cornea, to relieve intra-ocular pressure, and to promote a so-called antiphlogistic effect, by its influence upon the distention of the deeper vessels.

Therefore, atropine is to be applied immediately in all fresh cases of keratitis. But the dose is much smaller; one or two drops daily are sufficient. Excepting, first, those cases in which so copious a discharge of tears takes place that the solution will be very soon washed away. Secondly, all forms of keratitis in which the permeability of the cornea is diminished. Thirdly, those cases of keratitis which are characterised by an intense injection of the deeper vessels and by the tendency to be complicated with iritis. In these varieties it is sometimes necessary considerably to increase the dose of atropine for a short time, but it is advisable to diminish it so soon as the pupil is fully dilated.

In the common forms of superficial keratitis, such as pannus, phlyctenulæ, little infiltrations, small superficial ulcerations, I stop the application of atropine at once as soon as a single application produces an effect for twenty-four hours. I then proceed in all the above-described forms of disease (but on no account in parenchymatous keratitis) immediately to apply nitrate of silver. This is in opposition to the usual mode of treatment, but I always found it followed by a most favourable result.

The rule, viz., to administer the atropine so as to dilate the pupil, and so soon as it remains dilated by a small dose for twenty-fours to commence the solution of nitrate of silver, appears very empirical; but it is founded on this, that even the rapidity, the facility, and the duration of the effects of the atropine give a correct indication of the intensity of the deeper irritation. In the latter, nitrate of silver will not be tolerated, but it acts very favourably as soon as the deep irritation has subsided.

Only in parenchymatous keratitis do I continue the use of the mydriatic for some time after the cessation of the deep irritation.

Operations.—1. *Extraction of Cataract.*—The dilatation of the pupil before the operation is not absolutely necessary, but desirable. Immediately after the escape of the fluid of the anterior chamber the pupil contracts; but we do not thereby lose the benefit obtained by the before-procured dilatation, because without atropine the contraction would be much stronger. Another advantage consists in knowing the degree of dilatation of the pupil that can be obtained in every case, for, especially in old people, with otherwise normal eyes, this varies considerably. *After* the operation the effect of atropine is partly prophylactic and partly therapeutic. With regard to the latter, we must refer to the instructions given for the treatment of iritis. With regard to the prophylaxis we must proceed in a very different manner, according to the individual cases and according to the method of the operation. For my method of extraction I have made many comparative experiments, and have at last found it most desirable to put the atropine in on the second day, usually a single drop, and not to repeat it so long as the pupil remains dilated. Only in the rare cases in which it is impossible to remove completely the remains of the cortex do I put in a drop of atropine immediately after the operation, and again after the first twenty-four hours. But if unexpected irritation should arise I apply the atropine at once, energetically.

This and the dry bandage constitute, almost without exception, the whole of my after-treatment.

2. *Discission.*—Whether we perform this operation in cases of secondary cataract, partially absorbed or completely softened cataracts, it is always necessary, before the operation, to dilate the pupil, and energetically to keep it well dilated by a prophylactic application of atropine. Difficulties in the application of it, such as we have already mentioned when describing the treatment of iritis, must be well considered beforehand, because they may give, under certain circumstances, a contra-indication for discission, and compel us to extract.

If after the discission a considerable swelling of the lens takes place, so that the resulting irritation of the iris cannot be overcome by the strongest possible dose of atropine, this gives an urgent indication for immediate extraction of the lens, after which the atropine will regain its lost power.

3. *Iridectomy.*—In an operation so variable it is not possible to establish a general rule for the use of atropine. We must, therefore, indicate a few of the leading points with reference to it. In the operation itself there is neither an indication to apply the atropine beforehand nor after the operation for prophylactic or therapeutic purposes. In an artificial pupil made only for optical reasons it unecessary; for glaucoma, where the therapeutic effects of the iridectomy is intended, atropine seems to me decidedly injurious.

I should object, also, for the reasons mentioned under iritis, to its application in cases of iridectomy with total and completely fixed adhesions of the pupillary margin to the capsule, or to the corneal cicatrix. But an energetic application of the mydriatic in other cases, immediately after the iridectomy, may be of great use; thus, for example, in adhesions which are limited to one side of the pupil, but cannot be entirely included in the operation of iridectomy, so that on one or both sides of the artificial pupil small adhesions remain. Sometimes we succeed in removing them after the iridectomy by the use of atropine. Sometimes, also, the atropine produces an effect after the iridectomy, which could not be done before the operation, in such cases as hypopion keratitis with consecutive iritis. In these cases the effects will be facilitated by removing the exudation from the anterior chamber, and also by excising a portion of the adhesions, and, lastly, by diminishing the inflammatory state of the deeper parts following the operation.—*St. Thomas's Hospital Reports*, 1873, *p.* 183.

112.—ATROPINE AS AN ANTIDOTE TO OPIUM.

By Dr. James Johnson, Medical Officer to the Chinese Hospital, Shanghai.

Without entering into detailed remarks on individual cases, I may observe that, on every occasion when atropine was injected, the patient was at that time, or very shortly afterwards, in a state of the most profound coma, and utterly insensible to the cold douche, galvanism, or any other remedial measures, and the general condition was as follows:—Pupils firmly contracted to a pin's point, and immovable; conjunctiva and surface of cornea insensible to touch; face pale; lips, eyelids, and nails livid; pulse weak and irregular; respiration slow and stertorous; extremities cold, and the state of the body generally such as to give it the appearance of a lifeless mass. It was in this condition that the wonderful power of atropine showed itself. The quantity ordinarily injected was half a grain, and its effects were, that in from ten to twenty minutes the pupils began to dilate slowly, and after an hour or more the face became flushed, the respiration soft without stertor, the pulse stronger. Within two hours the full effects of the drug were usually manifested—viz., widely dilated pupils, flushed face, hot skin, tranquil, slow breathing, diminished frequency and increased strength of pulse, followed by calm and tranquil sleep, from which the patient was easily waked after three or four hours. The indication for repeating the injection of atropine was the failure of the first dose to produce within two hours the dilated pupil, flushed face, and slow, steady, tranquil breathing. The dose injected varied according to the degree of coma; when very profound, half a grain was the usual dose; when only partial, a quarter of a grain, repeated afterwards if necessary. The action of the atropine was very uniform—dilating the pupil, strengthening and steadying respiration, and lessening the frequency and increasing the strength of the pulse. Of the fatal cases in which atropine was used, the first one reported lived for eighteen hours, and the action of the atropine was very manifest, as the patient partially recovered consciousness, and did not perish from the comatose effects of opium, but from exhaustion following that condition. In the second fatal case the patient was only two hours and a half under treatment, and died from cerebral apoplexy. The third was under treatment a little over two hours, and died from cerebral effusion. The fourth was two hours under treatment, and died from exhaustion. The fifth was under treatment for five hours, and died from convulsions. The sixth also died from convulsions, and was under treatment for three hours and a half. During the past seven years, upwards of three hundred cases of opium-poisoning have come under my observation in this Hospital. In the majority, where the patient was brought within an hour or two after swallowing the poison, the ordinary treatment—by emetics, stomach-pump (when required), cold douche, moving the patient about, stimulants and coffee—was successful; but in the worst of cases, when the hapless patient was in profound coma, and insensible to cold douche, galvanism, and artificial respiration, remedies were often of no avail, and the wretched suicide died.

In July, 1869, I first injected atropine subcutaneously in a very bad case of opium-poisoning, and although it failed to rescue the patient, I was so struck by its effects that I resolved to make a further trial of it. The class of cases in which the wonderful powers of atropine as an antidote to opium-poisoning are most marked, is where profound coma exists; and for such a condition I know no other remedy. You may try to drag the patient about, use the cold douche, carry on artificial respiration assiduously, give stimulants of every description; all in vain—the patient remains comatose and lifeless. Administer atropine, and the effects are marvellous: the pupils dilate; the face becomes flushed; the respiration loses its stertorous character and becomes slow and tranquil; the pulse is diminished in frequency and becomes stronger; the patient slumbers peacefully for several hours, and at last wakes up conscious. I have said that all the cases reported in which atropine was used were of a severe kind, and that the treatment by emetics, &c., in milder cases was usually successful; but in some instances I have observed very unfavourable changes set in very rapidly, even in the mildest cases of opium-poisoning. This has happened so frequently that I have come to the conclusion that whenever there is contraction of the pupil and great drowsiness after the evacuation of the contents of the stomach and the moving about of the patient for a little, it is always advisable to exhibit a small dose of atropine, so as to bring the system under its influence. I may remark that in no instance have I seen any bad effects following the subcutaneous injection of atropine. After recovery the patients complained of great lassitude, dryness of throat, double vision, &c., but they usually recovered from these symptoms very soon. The conclusions I have come to with reference to the treatment of cases of opium-poisoning are—

1. That in mild cases, when the patient is seen within one or two hours after taking the poison, and is conscious and able to move about, with pupils uncontracted and movable, the ordinary treatment by emetics, &c., will usually suffice for recovery; but the greatest watchfulness and care are necessary, for even in the mildest cases dangerous symptoms speedily set in. As a rule, whenever there is great drowsiness, with contracted pupils, after the evacuation of the contents of the stomach and moving about of the patient, it is advisable to bring the system under the influence of atropine at once.

2. The state of the pupils is of the first importance. Whenever they are firmly contracted to a pin's point, there is danger; although the patient for the time may seem but slightly affected, sooner or later coma inevitably comes on. It is, therefore, advisable in such cases to use atropine at once.

3. That in cases when the nervous centres do not respond to the cold douche and moving about the patient, it is not only useless, but mischievous, to persist in attempts to drag the individual about, as it only increases the exhaustion, which is one of the greatest dangers in cases of opium-poisoning. The treatment for such cases is to place the patient in the horizontal position, and inject the atropine subcutaneously, and, if necessary, assist with artificial respiration, and, in case of exhaustion, to strengthen the circulation by applying warmth and counter-irritation to the limbs, and by the administration of stimulants, such as coffee, ammonia, brandy, &c., internally.

4. That in all cases of profound coma from opium-poisoning, with perfect insensibility, firmly contracted pupils, and stertorous breathing, atropine should be exhibited at once, and the patient carefully supported afterwards by the administration of coffee, ammonia, and stimulants.

5. That, when the system is fairly under the influence of atropine, with re-

spiration tranquil, however slow it may be, it is undesirable to interfere by artificial respiration, as it only embarrasses the breathing and interferes with the tranquil sleep which usually follows the exhibition of atropine.—*Medical Times and Gazette, Feb.* 15, 1873, *p.* 175.

113.—ON THE ACTION OF NARCEINE.

The sedative qualities of opium are due to a greater mixture of alkaloids than any other remedial means. Nevertheless, whilst some of these, as morphia and narceine, produce sleep, others as narcotine and thebain, produce convulsions and cramps. It is obviously, therefore, expedient that when it is desired to produce sleep, morphia and narceine should be administered in a pure condition, apart from those alkaloids which, by their exciting action on the nervous system, would tend to prevent sleep. The best experimental investigations of late times demonstrate that narceine is better adapted for the purpose of inducing sleep than morphia; that it is entirely free from all exciting action, and acts as a pure narcotic. This has been demonstrated by poisoning animals with narceine, when they die in sleep without any indication of convulsions. Similar experiments, though of course not carried so far, have been made on man, and have shown that the sleep produced by narceine differs from that of morphia in its deep and quiet character, and the unexcitability of the body to loud noises or other stimuli.

The phenomena of paralysis and mental debility, remarked as a rule after the use of morphia, are entirely absent after narceine, as are also the headache, feeling of indisposition, and nausea which sometimes lead patients to object to that remedy.

Eulenburg was the first who instituted experiments with narceine. It dissolves in 875 parts of water at 17° C., and it may be used both as an internal medicine and hypodermically. It is best given, on account of its high price, by the latter method, for whilst when administered internally from one-sixth to half of a grain is required, only one-eighth to one-quarter of a grain is requisite when subcutaneously injected. Since the larger of these doses have no deleterious secondary action, they may be increased if occasion require; indeed it may be given in the same quantities as morphia itself.

Narceine, besides its general narcotic properties, may also be advantageously employed as a local sedative, producing not only temporary alleviation of pain in many cases of neuralgia of peripheric origin, but also permanent and complete recovery.

Narceine is a highly nitrogenous compound, found only in opium, and forms colourless columnar crystals. It has a bitter pungent taste; it melts at 92° C., and unites with difficulty with acids. With several mineral acids it forms combinations that turn blue on the addition of water, become colourless on the addition of more water, but again become blue on the addition of chloride of calcium.—*Practitioner, Dec.* 1872, *p.* 379.

114.—AMMONIA IN WORKSHOPS AS A PREVENTIVE OF MERCURIAL POISONING.

In a recent communication to the Paris Academy of Sciences, Dr. Meyer made known the excellent results which he had obtained in preventing all symptoms of mercurial poisoning in the looking-glass manufactory of St. Gobain by sprinkling the floor with ammonia. He cannot explain the preservative action of ammonia, and it was accidentally that he discovered this effect; but he states that during the five years that it has been employed at St. Gobain, not one case of poisoning has been observed among the workmen, whilst there is a marked amendment in the symptoms of those who were previously affected. About half a litre of common liquid ammonia is simply to be sprinkled on the floor of the workshop every evening after the day's work.—*Lancet, April* 26, 1873, *p.* 601.

115.—ON THE THERAPEUTIC USES OF ELECTRICITY.

By Dr. SAMUEL WILKS, F.R.S., Physician to Guy's Hospital.

[Electricity was first used at Guy's Hospital in 1836. The Leyden jar was used to stimulate lethargic organs, but more frequently the isolated stool. The patient who sat upon the stool was electrically isolated, and by his holding a chain attached to the prime conductor became charged with electricity. Sparks were then drawn from his limbs or spine, according to the part wished to be operated upon. After the introduction of electro-magnetism, or faradisation, frictional electricity fell into disuse, but it appears not improbable that a valuable therapeutic agent was thus abandoned.]

A fresh impulse was given to the subject of galvanism by Remak, who demonstrated the great advantage of the simple continuous battery current over the induced or secondary current known as faradisation. Remak asserted that in experiments on animals the effects of the two forms of galvanism were very different; and his statements as regards paralysed muscles were soon verified. We therefore at once procured for our electrifying room a galvanic battery of a hundred cells, which was capable of being used of any strength. Our assistant, Mr. Sandy, made also a portable machine, which could be carried through the wards. It was very soon apparent that we had made a very important addition to the therapeutic value of galvanism, for we found that the current passed down the spine would influence the condition of the lower limbs where faradisation had altogether failed; and we found, also, that in various forms of paralysis an effect was not only produced where faradisation was inert, but that in some cases the muscles were more susceptible to its influence than in health. In the first case in which it was employed the effects were most striking; it was that of a man who had a paralysed arm, with a gradually progressing wasting of the muscles. It was quite unaffected by faradisation; but, immediately the continuous battery current was used, contraction of the muscles took place, and from this time a gradual cure was effected. It was exactly the same with a case of lead-paralysis. Here no effect was discernible on the application of faradisation; but, on the other hand, there was an extreme susceptibility to the influence of the primary current.

You must understand that the simple transmission of the current along the spine or limbs produces apparently no result—or at least it has to be yet discovered that a current continuously flowing through any part of the body has any effect either on the muscular or the nervous system. It is only when the circuit is broken or closed that an effect is seen. Thus, in the case of the man mentioned just now with the paralysed arm, one pole was placed on the shoulder and the other was stroked down the deltoid, when, on lifting it from the surface, an immediate contraction of the muscle and elevation of the shoulder took place; and the same occurred again on replacing the electrode. In the case of lead-paralysis, in like manner, one pole was placed on the back of the fore-arm over the upper part of the extensors, and the other pole lower down; when contact was made or broken, contraction of the muscle immediately took place. In this case, as in similar ones, a smaller amount of galvanism roused the irritability of the muscle than would have been required for a healthy arm. If the hand, also, be placed in a basin of water, and one pole of the battery continually dipped in and taken out, whilst the other pole is fixed on the back of the arm, contractions likewise take place. By using the continuous current in these ways, we are now curing very rapidly our cases of lead-paralysis. As severe an example of this disease as you could well see was that of the woman who lately left our wards, and whose muscles were so wasted that she was obliged to keep her bed, and was unable to lift her arms to feed herself; yet by persevering in this form of galvanism for three weeks she completely recovered. It is the continuous current which is probably most useful in infantile paralysis.

As regards its application in cases of paraplegia, we place one pole on the upper part of the spine towards one side of the neck, and the other pole on the lower dorsal region, and as often as the circuit is opened or closed a sensation is experienced. At first the effect is stimulating, and afterwards it is soothing. A sensation of warmth is experienced through the whole body, followed sometimes by sweating; and if the current be powerful, it may excite headache and stimulate all the nerves of special sense, causing noises in the ears, sparks in the eyes, metallic taste in the mouth, and at the same time often producing an urticarious rash on the back. In a short time the patient feels soothed; if he has had pains in the limbs, they are relieved, and he is inclined to sleep. The simple battery current appears to rouse the dormant power of the cord, and is thus curative in various forms of paraplegia where no organic disease is present. Thus it has been found to be most valuable in some cases of paralysis of motion or akinesia; but it is more especially in cases of want of control or ataxia that its effects have been most marked. In some very severe and chronic cases, where there was reason to believe, from the duration and intensity of the symptoms, that some degeneration of the posterior column of the cord must have existed, a complete cure has been effected. In one case where progressive muscular atrophy had commenced, the disease was arrested by the same means; and in one case of paralysis agitans, where galvanism had hitherto failed to produce any benefit, it seemed as if the patient were deriving good from its use.

The soothing effect of the battery current is most striking. Thus, in the cases of ataxia of which I speak, pains in the limbs exist as a common symptom, and these are much relieved by its use. In other cases where the paralysis is irremediable, the sedative effect of galvanism has been sufficient to determine its continued use. Thus, in a man now in the hospital with a permanent contraction of the legs from chronic meningitis, from which it is not likely that he will ever recover, so much relief is obtained by the application of the galvanic current to the legs, that the man asks for it in order that he may procure sleep. I can recall several cases of various forms of paralysis where galvanism was most useful in relieving pain and restoring sleep. In simple and pure neuralgia, I can quite corroborate what others have said as to the value of galvanism, and more especially of the primary battery current. I have known faradisation to cure lumbago, but it is the other form of galvanism which has been attended by the most marked success. The relief obtained is generally immediate, and in some case of frontal neuralgia one application has been sufficient. In longer standing cases, as in that of a woman who was in the clinical ward, a neuralgia of the face, of months' duration, was cured in a fortnight. Since this, we have had two somewhat similar cases.

The greatest disappointment which I have experienced hitherto has been in spasmodic affections of the muscles. In old cases of contraction of the limbs, due to organic change in the centres or nerves, no cure could be expected; but in the temporary and functional forms it might have been hoped that in galvanism we had a speedy means of relief. This has not been so, however, in my experience. I have had the case of a contracted arm in a girl which, for want of a better name, we called hysterical, and in her we used galvanism most perseveringly; we tried both forms, and in various modes, reversing the currents and operating on both the affected and unaffected muscles, but with no success. It was just the same with the case of wry-neck lately in the Hospital. The man had galvanism most unremittingly applied to the contracted muscle as well as to the healthy ones. It was used in various modes by Mr. Sandy, but only with temporary benefit. If he appeared better for a day or two, he again relapsed into his former state.

We have, therefore, much yet to learn in reference to the uses of galvanism—as to the value of its different forms, as to the intensity and quantity of the force used, and as to the direction of the currents. Since every nerve in a limb contains fibres of two functions—motor and sensitive—whose forces are travelling, we suppose, in opposite directions, it follows that, if a galvanic current be made to run along the nerve. it may favour the action of one of these streams of force and oppose the other. This seems to be the case by experiments on frogs and other creatures, where a galvanic current passed down the leg will cause contraction of the limb, whereas if the poles be reversed the animal will cry out, and every muscle of the body will start. This experiment would seem to show that direction should vary according as we wish to affect a motor or sensory nerve. At present we simply test the different modes of application on our patients, and treat them accordingly.

As regards the different effects of the primary and secondary currents, it has been suggested that these are due simply to the fact that the one is continuous and the other interrupted; therefore, that if the battery-current were broken, it would be found that a muscle or nerve could take cognizance and be affected by it (supposing the susceptibility to faradisation had been shown), whereas if it flowed simply through these structures it would pass unfelt. We have tried the experiment, but hitherto without the result expected; and therefore for the present we have been obliged to regard the two forms of galvanism as practically different. Then, again, it is said that the battery-current acts directly on the nerves, whilst the faradic current acts immediately on the muscle; but a discussion of this matter involves the larger inquiry as to the dependence of the muscle upon the nerve for its contractility. The question has not yet been settled. On the one hand, we observe the contraction of the muscle on the application of a stimulus when it is entirely severed from the nerves of the body; and, on the other hand, we know that the muscle gains some kind of stimulation through the nerve, since we observe the dropped face in paralysis of the portio dura, and the falling of the head if sleep overtake us in our chairs. Dr. Marshall Hall believed that whilst a muscle retained its connection through a nerve with the spinal cord its contractility remained, but if the connection were severed this quality was lost. He thus by means of galvanism endeavoured to show the nature of the paralysis. In all probability some of his observations were correct; and no more important question in relation to galvanism can be studied than this, for by making experiments on muscles and discovering the connection between their condition under the influence of electricity, and the integrity of the nerve centres, we shall be able to use the therapeutic agent as a test. By observing the behaviour of muscles under the influence of galvanism, we may form an opinion as to the state not only of the muscle itself, but of the nerve-centre from which some of its qualities are derived. Of course, when Marshall Hall used the expressions "cerebral and spinal paralysis," he meant in the one case, where a limb was paralysed because cut off from its connection with the brain; and, in the other case, where it occurred from disease of the cord itself. There is no such thing as cerebral paralysis in the sense in which he used it. As a matter of fact, we find, as he asserted, these different effects. Thus there are now in the wards two cases of paraplegia in which the continuous current, whilst exciting contraction in the one, has no effect on the other.

Another question which we want solved is this: Is the continuous flow of galvanism or electricity through the body of any service? It has been thought that the current passes simply over the surface of the body, and thus must be quite ineffectual in influencing the deeper structures; but I believe such a view has been found to be erroneous, and that a current of electricity may, for example, be made to pass quite through the brain. We require often not only to put more life into a portion, but into the whole of the body, as, for example, into that of a little child who may be lying completely powerless after an attack of chorea. Now I believe Pulvermacher's chains are supposed to act in this manner—that is, by simply supplying a stream of electricity to the body. I have seen these instruments much in use, but I cannot say from my own observation that I have ever witnessed much good accrue from them. We are, however, about to make a machine which the patient can wear on his back, and thus I hope we shall soon be able to solve the problem. Since the effect would not be immediate, the method must be long continued. We have also been making experiments with an electric bath, but at present the results are doubtful. With respect to other uses of galvanism, as in cure of aneurism, as an actual cautery, &c., I leave them to be treated of in their special departments. —*British Medical Journal, Jan.* 11, 1873, *p.* 29.

116.—ON THE USE OF THE DIRECT AND INDUCED CURRENTS OF ELECTRICITY.

By Dr. WALTER G. SMITH, Assistant Physician to the Adelaide Hospital, Dublin.

Among the more recent and positive gains to electro-therapeutics we can fairly reckon the better discrimination as to the respective functions of the induced (so-called *interrupted current*), and of the direct (or so-called *constant* or *continuous current*), and the indispensableness of the latter in certain cases of paralysis; the use of electricity in laryngeal affections, and the more certain relief and cure of severe forms of neuralgia and of some conditions of perverted sensibility; the wide diffusion of a correct knowledge of the methods of electrization; the application of electricity to diagnosis and prognosis, a subject most unjustly ignored in ordinary practice; the proved possibility of directly galvanizing the brain and spinal cord; and, lastly, the utilization of electricity in surgery for its healing powers, or for its chemico-vital effects in causing coagulation of the blood, and in producing discussion of tumours.

Any reference to "general faradization," and the so-termed "galvanization of the sympathetic" is designedly omitted, for these methods do not appear to me to rest as yet on a sufficiently sound foundation. Niemeyer, whose opinion is justly entitled to respect, and who certainly cannot be charged with credulousness, was firmly convinced "that the introduction of the constant current into practice is one of the most valuable advances of modern times, and that *in the constant current* we have a means more powerful than any other of modifying the nutritive conditions of parts that are deeply situated." And it seems to me, that this vital influence of electricity on nutrition has scarcely obtained the attention which it merits, and that in our practice and teaching too exclusive a part is ascribed to the merely stimulant action of the current on nervo-muscular tissue. Electricity is a muscular stimulant, but it is something more.

Bell's Paralysis.—Case 1. Mr. O'F., a medical student, aged twenty, applied to me in May 1870, for right facial paralysis, contracted four days previously after exposure to cold air. Next morning he found that he could not spit straight, and the usual signs *gradually* developed, although without much oral distortion, and at first there was numbness along the right side of the tongue; hearing was more acute on the paralysed side, and he could not retract the right ear. As to treatment, it is sufficient to state that both the direct and the induced currents were used, that the muscles rapidly regained their functions after seven or eight applications, but for some time afterwards the tears had a tendency to escape from the eye, and he could not whistle so perfectly as before the accident. In the commencement twitchings occurred in several of the muscles, especially the orbicularis oculi. In the course of treatment I observed a circumstance which was new to me at the time, and which is, at least, quite the exception. It is commonly stated that at any rate after a few days the muscular contractility to induced electricity is below par in the paralysed side, or may even be abolished altogether, and that this condition will even enable us to diagnose an eccentric facial palsy from one of central origin, in which the electric contractility is preserved intact. As a nearly universal rule this is, no doubt, true; but in this case the paralysed muscles uniformly responded to a weak induced current, and also to a moderate direct galvanic current *more actively than the healthy* muscles for about a week, after which contractility became normal.

Case 2. In Dec. 1870, Miss P. called on me, by Dr. Stokes' advice, for incomplete right facial paralysis contracted five weeks previously. Even on the first trial she could nearly close the eye under the influence of a gentle primary induced current, but both galvanic and faradic excitability were decidedly diminished, and the current was less felt on the paralysed side. Yet after a short time (three weeks) the galvanic excitability was heightened, for six (Leclanché) cells caused vigorous contractions on the paralysed side and none on the left side, and what is more remarkable, the current from a *single cell* evoked unmistakeable contractions of the paralysed half of the sphincter oris. The progress of this case was unusually tedious. Excitability to the induced current was very slowly regained, and even when motility was nearly perfect and the facial distortion had disappeared, the paralysed muscles responded more to a direct galvanic current and less to the induced current than the healthy muscles. Rapid interruptions of the direct current by the hand caused *tonic* contractions of the muscles. The treatment extended over about two and a half months, and perhaps some reason might be found for this in the fact that the paralysis had set in with pain, had existed for more than a month before treatment was commenced, and occurred in a lady of a highly nervous and excitable temperament.

Lead Palsy.—On this affection I shall make but one or two remarks, without detailing any cases. In two instances within the past year, I have seen more or less paralysis of the legs as well as of the arms, and one of the patients walked at first with a staggering gait, not unlike that of "ataxy." The gravity of the paralysis certainly seems to bear no constant relation to the degree of muscular atrophy; for it will, I think, be found that every grade of paralysis may occur with or without much atrophy of the muscles, and cures will undoubtedly be effected even when the contractility of the muscles to induced electricity is apparently quite lost. In severe cases, although the patient may be so far relieved that he is able to return to his work, the palsied muscles seldom regain their full bulk and vigour. Flabbiness and want of consistence of the muscles is a simpler and probably nearly as good a test of their vital condition as electric contractility, and the sensibility of the skin and muscles, so far from being always impaired, seems often to be exalted, and muscular faradization by a moderate current is frequently attended with a deep-seated acute pain.—*Dublin Journal of Medical Science, February*, 1873, *p.* 161.

117.—A NEW ANODYNE COLLOID.

Dr. Lackerstein, of Queen AnneS treet, has favoured us with a sample and formula of what seems likely to prove a useful application in neuralgic and other localised pains. The composition is as follows :—R. Amyl. hydrid. ℥ j.; collodion (B. P.), ℥ j.; aconitiæ, gr. j.; veratriæ, gr. vj. This forms a colloid which should be brushed over the painful part five or six times, forming successive films. If the pain be not at once relieved, the absorption of the alkaloids may be favored by covering the colloid film with a layer of spongio-piline. We have tried the remedy, with good, though not conclusive, results, in two cases of supra-orbital neuralgia. It certainly seems worthy of extended trials. —*Practitioner, Jan.* 1873, *p.* 63.

[Dr. Lackerstein says : "It has given me very satisfactory results in neuralgia, sciatica, lumbago, and all muscular pains, etc. It relieves local pain for the time, and procures a good night's rest, while, of course, the internal treatment appropriate to each case is carried on. The amyl hydride is the only new ingredient; but I think the colloid is a clear and elegant preparation."]

118.—TINCTURE OF VERATRUM VIRIDE IN ACUTE RHEUMATISM.

By Dr. William Carter, Physician to the Liverpool Southern Hospital.

In the last (5th) volume of the Liverpool Med. and Surg. Reports is a short notice of three consecutive cases of acute rheumatism, treated by the administration of two minims of the tincture of green hellebore every hour, until the pulse was reduced to its normal degree of frequency, when the dose was diminished to one minim. In all three instances, the patients made remarkably rapid recoveries. I now add a fourth, the only other instance of really acute rheumatism that has been since admitted under my care. Like them, it shows the remarkable power which the drug in question possesses of steadily reducing the frequency of the pulse hour by hour; and, like them also, this case was of remarkably short duration. The record of many more cases than these (and of an equal number previously published by Dr. Silver, Physician to Charing Cross Hospital) is required before it would be safe to say that veratrum viride, when thus administered, had a manifest advantage over other drugs in cutting short the duration of acute rheumatism; but, at any rate, the results are sufficiently encouraging to make it desirable to continue the observations.

T. B., æt. 25, a labourer, was admitted into the Southern Hospital, under my care, on July 20th, 1872, suffering from acute rheumatism. He gave the following history:—After a life of health, he had begun, a month before admission, to suffer from slight rheumatic pains. On the night of the 17th July, the right knee was attacked by very acute pain, followed by much swelling, and accompanied by general fever. Other limbs became similarly affected, and he grew rapidly worse until his admission. He had been taking medicine before coming to hospital. He was a large, well-built man, but entirely helpless. Most of the joints were affected, and intensely painful. He was sweating very profusely, and the sweat had the usual sour smell. Tongue covered with a white fur. Temperature 102⅘° F. Pulse 112. He began taking the tincture immediately; but, by a mistake of the nurse, it was only administered every fourth hour. The next day, the pulse was 92, and the temperature 103⅖°. The dose was now given every hour; and in twenty-two hours afterwards the pulse had fallen to 82; the temperature being 102⅘°. On the following day, the 23rd July, the pulse was the same; while the temperature had risen one degree. At 2 p.m., on the 25th July, the pulse was at 68, and the temperature 101°. He was reported to feel "no pain, but much stiffness." On the 27th July, he is stated to be "still better; to be sweating much less; and to be almost entirely free from pain. Pulse 70. Temperature 100⅕°." On the 29th July, the medicine was discontinued, as he seemed to be well. He remained in the hospital until August 6th, taking quinine and iron. There was no relapse, and on that day he left. Besides the tincture of green hellebore, he had four fifteen-grain Dover's powders, one on each of four nights, and one black draught.—*Manchester and Liverpool Medical and Surgical Reports*, 1873, *p.* 43.

119.—LOCAL EMPLOYMENT OF CHLORATE OF POTASH IN CANCEROUS SORES.

In the "Berl. Klin. Wochenschrift," No. 6, 1873, Dr. Burow, of Konigsberg, advocates the local employment of chlorate of potash in the treatment of cancerous sores. His proceeding consists in sprinkling the sore with chlorate of potash in powder or crystals, and covering the whole with a wet compress. As the crystals of chlorate of potash exert a more powerful action than the powder, and excite greater pain, Dr. Burow uses the powder first, and replaces it by the crystals when sensibility has been abated. One of the cases was a cancerous sore of the left arm, which healed completely after eight weeks' treatment. Three other cases were cancerous sores of the breast; one was lost sight of, the other two are under treatment, and healing well. The fifth case recorded was connected with a cancer which originated in the periosteum of the upper jaw and left cheekbone, and then became ulcerated; in this case healing was complete in three months.—*Lancet, April* 12, 1873, *p.* 525.

120.—CLINICAL REMARKS ON THE RESINA COPAIBÆ AS A DIURETIC.

By Dr. S. Wilks, Physician to Guy's Hospital.

Dr. Wilks speaks with the greatest confidence of the value of the resin of copaiba as a diuretic. The ordinary copaiba has long been known for its action on the kidney, and is occasionally used in dropsy, but the nauseous taste of the oleo-resin has almost forbidden its employment. The oil separated from the resin is officinal, and is often prescribed in gonorrhœa instead of the compound substance. It is thought that the oil acts more especially on the mucous membranes, and is therefore useful in affections of the bronchial, vesical, and urethral surfaces. If this be so it is equally certain that the diuretic properties reside in the resin. Dr. Wilks has found it very difficult for patients to take the ordinary pharmacopœial drug, and almost impossible to get general practitioners to sanction its administration in private practice; he therefore has substituted for it the simple resin, and finds it equally or more efficacious. He gives fifteen or twenty grains in mucilage and flavored water three or four times a day, and has had numerous cases showing its marked diuretic properties. There is now in Guy's Hospital a man who came in with ascites, and who, after taking numerous other remedies, was ordered the resin. The amount of urine was at once doubled in quantity, and now, after a few days, the fluid has almost disappeared. Dr. Wilks says he has lately had as a private patient, a "drunkard builder," with cirrhosis of liver and enormous ascites, for whom he likewise prescribed the resin; a diuretic action was at once effected, and the dropsy quickly disappeared. In heart cases, also, he has given it with great success. Lately there was in the hospital a girl with mitral disease and considerable dropsy, who took the usual medicines without effect, and was then ordered the copaiba. It at once produced the desired result, and the fluid was dispersed. Dr. Wilks states that he has often given the remedy and failed; but on the other hand, when it has succeeded the result has been more striking than that arising from any other diuretic he has seen. He would wish it were placed in the Pharmacopœia, as it is not kept by chemists, although he is informed that it is used largely by perfumers, and the resin thrown away in large quantities as a waste material.—*Lancet, March* 22, 1873, *p.* 410.

121.—THE ABSORPTION OF TOBACCO SMOKE.

By Dr. Charles R. Drysdale, Senior Physician to the Metropolitan Free Hospital of London.

Every one knows that the chief injurious effects of tobacco are due to the nicotine contained in it. Hence, the importance of considering whether tobacco smoke contains nicotine. Now, Melseus collected from 4,500 grammes of tobacco smoke passed through water, 30 grammes of nicotine. Dr. Le Bon in the Giornale Veneto dei Scienze Mediche S., iii, 1872, remarks that the fact of nicotine being absorbed by smokers is proved not only by the injurious effects on the organism, but also by other circumstances. The alkaloid is soluble in water and in the fluids of the mucous membranes; smoke condensed and mingled with water becomes easily absorbed. As to the quantity of nicotine absorbed in smoking, science has as yet nothing exact to mention, since this varies according to the kind of tobacco used and the circumstances under which it is used.

Besides nicotine, tobacco also contains ammonia in notable quantity, which is taken up by the mouth and lungs. When cigars are smoked the constituent parts of the tobacco are turned into the form of vapour. A part of the smoke spreads itself over the cool tobacco leaf near the mouth, another part comes in contact with the cool mucous membrane of the mouth, where it is condensed and absorbed. The rest is spread about in the air. The further the burning process of the cigar proceeds, the moister does the tobacco leaf become, the more smoke arrives at the mouth, and becomes absorbed, so that the end tastes bitter, and beginners feel sick from this fact when smoking a cigar to the end.

Hence, it seems that in the smoking of cigars, especially if smoked to the end, a very notable quantity of nicotine and other constituents of tobacco are absorbed, even when smoking takes place out of doors, and the smoker does not inhale the smoke into the lungs. If the smoking take place in closed rooms, then not only are nicotine and the other parts of the tobacco taken up in the mouth, but also with each breath a portion of the tobacco smoke contained in the air of the room. The quantity of injurious substance of course becomes greater just in proportion as the room is smaller, and there are more smokers. A railway smoking carriage is, of course, the *ne plus ultra* of unwholesomeness in this respect.

Persons who indulge in the habit of first inhaling the smoke, and then expelling it by the nostrils and mouth, take up a much larger quantity of nicotine from the great absorption power of the lungs and other mucous membranes.

When pipes are smoked, even with short stems, there is much less injurious substance absorbed, because the smoke is absorbed in the cool tube, less of it arrives in the mouth, and, as is well known, is found among the ashes of the pipe. The longer the stem, the less of the constituents arrive at the mouth or lungs; hence the advantage of long pipes, and especially of Turkish hookahs, when the smoke passes through water.

With regard to persons who, not themselves smoking, remain in chambers where smoking takes place, they cannot in any way escape the injurious effects of tobacco smoke. If they do not inhale so much injurious matter as the smoker himself, still they take in on each breath a quantity of the constituents of tobacco smoke mingled with air; and to such a degree that he or she who lives in such a room takes in more nicotine than a smoker does who smokes only in the open oir.

Hence, it appears, that women who serve in public houses and cigar divans, are materially injured by a vice which their own sex is innocent of; and this fact may, perhaps, restrain some good-hearted male, who is quixotic enough not to care sufficiently for his own health.

It is now well known by the observations of Dr. Kostral in the Austrian State tobacco manufactory, that persons employed in tobacco manufacture, are subjected to many diseases, especially in the case of young women and boys.—*Medical Press and Circular, Feb.* 12, 1873, *p.* 131.

SYNOPSIS,

(ARRANGED ALPHABETICALLY), CONTAINING A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THIS VOLUME, SHOWING AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE HALF-YEAR.

AFFECTIONS OF THE SYSTEM GENERALLY.

ACUTE RHEUMATISM.—The remarkable power possessed by veratrum viride of reducing the strength and frequency of the pulse renders it a remedy of the greatest value in the treatment of acute rheumatism. Two minims of the tincture should be given every hour. (Dr. W. Carter, p. 262.)

BLOOD POISONING.—*Large Doses of Quinine.*—Quinine in large doses, as five grains every three hours, is a remedy by means of which we may tide the system over some period of extreme danger from blood poisoning with its attendent exhaustion of the vital powers. A farmer had been poisoned by means of a cut received during the post-mortem examination of a cow. He was evidently rapidly getting poisoned. His pulse was very small and weak, his arm was much swollen, and the axillary glands enlarged. Quinine was given in the doses recommended, and by the following afternoon he was out of danger. (Mr. N. Alcock, p. 32.)

CANCEROUS SORES.—*Chlorate of Potash.*—Chlorate of potash locally applied in cancerous sores has a great power in rendering them healthy and even promoting their healing. It should first be applied in the form of powder sprinkled over the sore, which is then to be covered with a wet compress. The crystals are more powerful than the powder, but as they excite greater pain, they should not be used at first. Cases are mentioned in which actual healing of cancerous sores was effected by this treatment. (Dr. Burow, p. 263.)

Rodent Cancer.—Do not think too lightly of small hard pimples and warts on the face in persons advanced in life, but promptly and thoroughly excise them, especially if they show a tendency to grow, ooze, and scab. Nitrate of silver only irritates. If the wart is so irregular or so situated that it is impossible to thoroughly excise it, the parts not reached with the knife should be burnt with a hot iron and have applied to them freely the chloride of zinc paste. Rodent cancer differs from other forms of cancer in its limited diffusibility; it infects slowly and only continuously the tissues around it, and its whole course is free from that remarkable upspringing of secondary knots from the infection of the lymphatic glands and distant viscera which characterises scirrhous cancer. (Mr. J. W. Hulke, p. 35.)

CHOLERA.—*Transfusion of Milk.*—The author has practised the transfusion of milk, freshly drawn from a cow, into the veins of two patients in a state of collapse from cholera. The effect after injecting fourteen ounces in the first case was rapid recovery, the purging and vomiting ceasing at once, and the pulse returning to the wrist. The milk was injected into a vein of the arm by means of a simple syringe. The syringe and bowl for the milk were heated to the temperature of 100°. (Dr. E. M. Hodder, of Toronto, p. 25.)

Enteric and Scarlet Fevers.—*The Relation between them.*—There is a certain relationship between scarlet and enteric fevers. There is the same tendency to intestinal mischief in scarlet as in enteric fever, but perhaps less marked, still both the solitary and agminated glands are inflamed. The stools have the same characters in the latter stages of both fevers. Rose papules if carefully looked for are not unfrequently found in scarlet fever. When they are unusually well formed and distinct they may even be distinguished when the scarlatinal rash is still vivid. Although typical cases may appear perfectly distinct there are some cases which, on our first seeing them, we at once pronounce enteric fever, yet a medical man a few days before would have called the same case scarlet fever. These cases are best distinguished as "abdominal scarlatina." (Dr. J. Harley, p. 21.)

Lumbago and Rheumatism.—Actæa is a most useful drug in the treatment of chronic and sub-acute rheumatism and lumbago. Out of fourteen cases of lumbago eleven were cured, and out of fifteen cases of chronic and sub-acute rheumatism eleven were cured. The actæa should be given in doses of half a drachm three times a day. In the case of two children the dose was ♏x and ♏xx, respectively increased to ♏xx and ♏xxx. Giddiness, headache, nausea, and irregular pulse are the symptoms produced by an overdose. The tincture should be freshly prepared. It is of no use in cases of gout. (Mr. J. J. H. Bartlett, p. 31.)

Scarlet Fever.—*Carbonate of Ammonia.*—Never give emetics, nor aperients, nor bleed, nor use leeches, nor do anything to lower the powers of life, but give carbonate of ammonia on the very onslaught of the disease, the earlier the better. Two grains is a proper dose for a child two years of age, four grains for one four years of age, and ten or twelve grains for one of sixteen years of age. It should be given in distilled or cold boiled rain water, every two, four, or six hours, according to the severity of the throat symptoms. The quantity of water to be regulated according to the same principle. The worse the throat the stronger the dose of ammonia, the smaller the quantity of water, and the more frequently given. If the powers of life are at a low ebb, give a little wine or brandy in addition. (Mr. G. J. S. Camden, p. 23.)

AFFECTIONS OF THE NERVOUS SYSTEM.

Chorea.—Give the patient a sufficiency of good plain wholesome food. Keep her in bed, in order that the muscular and nervous systems may have the greatest attainable repose, and thus prevent wear and tear. This also secures a uniform warm temperature. Prescribe two tablespoonfuls of compound decoction of aloes twice or thrice a day if there is constipation. This is all that is necessary in many cases, but if improvement is not going on satisfactorily, give sulphate of zinc in doses of two or three grains three times a day in water, and increase the dose until each dose produces slight nausea. Smaller-does than these are inoperative, and it is surprising sometimes what large doses are required before this practical test is produced. (Dr. F. W. Wade, p. 46.)

Headache.—*Ergot.*—Opium produces hyperæmia of the brain, hence it is quite unsuitable for most cases of headache. If combined, however, with extract of ergot, which counteracts that tendency, it has a most happy effect in many cases otherwise not admitting of relief. (Dr. R. Silver, p. 42.)

Migraine.—"Sick headache" is a neuralgic affection, usually of the fifth nerve, and belongs essentially to the period of bodily development. It most frequently occurs in patients among whose ancestors epilepsy has existed. The best plan to cut short an attack is to place the patient's feet in hot water and mustard, letting him inhale the steam that rises. Drowsiness is often produced by this, and on lying down the patient will feel inclined to sleep. It is admissible to assist this feeling by a dose of chloral, but unfortunately this cannot always be tolerated by the stomach. If, however, this is not successful, or is not thought advisable, the alkaloid caffeine, and the substantially identical theine, and guaranine, are each of them calculated to produce a peculiar effect in relieving the pain. The caffeine may be administered in doses of one or two grains by the mouth, or one-half or one grain subcutaneously injected. Should these measures fail, a good extract of Indian hemp should be given in quarter or half grain doses. (Dr. F. E. Anstie, p. 37.)

NERVOUS AFFECTIONS.—*Phosphorus.*—Phosphorus is a remedy of much use in certain nervous affections. In neuralgia, complicated with migraine; in nervous break-down from over-work it may prove of service, as shown by illustrative cases. It may be given dissolved in oil or lard, and enclosed in gelatine capsules. The dose is one-thirtieth of a grain two or three times a day, after food. (Dr. W. H. Broadbent, p. 48.)

NEURALGIA.—*Hypodermic Injection of Morphia.*—The hypodermic injection of morphia is as dangerous as it is effectual in neuralgia. Those who have learnt to fly to the syringe as a remedy from instant pain soon discover that in it they find also a stimulant which possesses a fascination as potent as that of alcohol. The regular use of morphia in this way sets up a periodicity in the system which actually favours the return of pain, and, moreover, during that regular use other treatment is useless. (Dr. T. C. Allbutt, p. 228.)

In cases of neuralgias and other localised pains, the following colloid is a useful application. It should be brushed lightly over the part five or six times, forming successive films. Amyl hydrid, ℥j.; collodion (B.P.), ℥j.; aconitiæ, gr. j.; veratriæ, gr. vj. (Dr. Lackerstein, p. 262.)

PARALYSIS.—*Hypodermic Injection of Strychnine.*—The strychnine solution should be used sufficiently concentrated. The one-twenty-fifth of a grain may be injected at first, but the dose must be rapidly increased up to one-tenth or one-eighth of a grain. When a concentrated solution is used, the effects are more local than when it is diluted. (Dr. W. Carter, Mr. Barwell, pp. 52, 55.)

Paralysis of One Limb only from Lead Poisoning.—The case of a man whose right arm only was affected with paralysis, accompanied with extreme muscular atrophy, is related. This was accounted for by the lead having been absorbed only through the right hand. The case illustrates the great benefit resulting from the use of electricity. The constant current was used daily for eight weeks: faradaic irritability then returned, and in another month of treatment with the latter both the power and the bulk of the muscles were almost completely restored. (Dr. F. E. Anstie, p. 33.)

VOLUNTARY MUSCULAR ACTION.—*Influence of the Continuous Galvanic Current.*—If a weight is held out at arm's length until the muscles are no longer able from fatigue to continue in action, and a continuous galvanic current is then passed through the painful muscles, the deltoid, biceps, and triceps, all fatigue will at once vanish. This proves that voluntary action is assisted by the electric stimulus. In the use of electricity in cases of paralysis the patient should be directed to exercise the muscles at the same time the electric current is passing through them. It will then be found that the muscles are susceptible to the stimulus of the will which before were not so. (Dr. G. V. Poore, p. 58.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

ACUPRESSURE—*A Modification of.*—The great objection to acupressure is the disturbance of the tissues caused by the "corkscrew" of wire during its withdrawal, and the consequent danger of disturbing the clot. This difficulty may be overcome by using silk ligature or catgut instead of wire. The needle is to be passed under the vessel, and its point made to emerge beyond it. A double ligature is then to be passed under the point, then brought backwards and tied in the usual surgical knot under, but a little to one side of the proximal end of the pin. Of the four ends of ligature three should be cut off neatly, leaving the fourth. Two loops may seem unnecessary, but it is not so; for, when only one
takes such firm hold of the tissue about the vessel that, during its
safety of the clot is endangered. To withdraw: first remove the

pin by a gentle twisting motion; after which, the knot being liberated, the ligature can be readily pulled out. (Dr. J. C. O. Will, p. 111.)

ANEURISM.—*Aortic.*—It now seems a well established fact that aortic aneurism may be—perhaps not cured—but much benefited by coagulation of some of the blood contained in it by means of galvano-puncture. The needle used should be insulated to within half an inch of its point by means of vulcanite. It should be passed obliquely into the aneurismal sac. A zinc plate connected with the negative pole is then to be applied to the chest-wall on the opposite side, and about three inches from the edge of the swelling, a sponge wrung out of warm salt water intervening between the plate and the skin. It may be employed for half an hour at a time. As the result of two operations, at an interval of five days it was found in one case that the tumour was smaller, and for the most part firm and solid. It was again repeated with more marked improvement still. As it is slow coagulation we want, it is better not to employ a very strong current. (Dr. McCall Anderson, p. 112.)

Popliteal Aneurism.—Dr. Thompson, of the Tyrone Infirmary, describes a mode of applying pressure to the iliac artery in cases of popliteal aneurism by means of an apparatus which any surgeon of ordinary ingenuity can make for himself. This is peculiarly suitable to the general practitioner. The plan will be understood at a glance by referring to the wood-cut at p. 110. (Dr. H. Thompson, p. 110.)

EPISTAXIS.—*Plugging the Posterior Nares.*—This may be done by means of a small pyramidal India-rubber bag, the point of which ends in a tube. The larger end is wrapped round a probe and introduced into position, being passed through the nares. The small bag is then inflated with air or water by means of the attached tubes. A piece of inelastic tissue, let into the India-rubber at the point of juncture of the tube and ball, will enable the necessary traction to be made to occlude the posterior nares. (Dr. R. P. B. Taafe, p. 115.)

Mr. Godrich has invented an instrument which promises to considerably facilitate this operation. It consists of a small elastic bag, stretched on the end of a hollow style. It is pushed through the nasal fossa, and then dilated with iced cold water. The bag, thus dilated, is drawn well forward, and an India-rubber plug is slid along the style and firmly fixed into the anterior nares. The cohesion between this plug and the style is sufficient to hold both plugs in position; if not, a piece of string tied round the style in front of the anterior plug will ensure perfect security. The instrument is made by Messrs. Louis Blaise and Co., 67 St. James's Street. (Mr. A. Godrich, p. 115.)

AFFECTIONS OF THE RESPIRATORY SYSTEM.

HÆMOPTYSIS.—*Ergot.*—Hæmoptysis is not unfrequently the actual cause of phthisis. The blood remaining in the delicate lung structure acts as an irritant and excites changes for which doubtless the system is prepared. It will be seen, however, from this how important it is at once to check the hemorrhage. For this purpose there is probably no remedy more effectual than forty-minim doses of the liq. ext. ergotæ every four hours. (Dr. F. E. Anstie, p. 63.)

[In these cases we have for many years been in the habit of injecting a little morphia subcutaneously. Its action is rapid, decided, and almost invariable.—EDS.]

Ergotine in doses of from half a grain to two grains injected subcutaneously is an excellent remedy in cases of hæmoptysis. The best vehicle is glycerine. (Dr. Drasche, p. 68.)

LARYNGOTOMY.—In cases of growths within the larynx too large or too numerous to be treated in any other way, and producing such urgent symptoms that relief is imperatively demanded, we must open the larynx by an incision carefully carried along the middle line. The thyroid cartilage and the crico-thyroid membrane should first be divided, and the section should then be continued upwards through the thyro-hyoid membrane and downwards through the cricoid cartilage and upper rings of the trachea to the extent necessary in order to expose fully and completely the bulk and points of attachment of the tumour. Before reaching the vocal chords a director should be passed through between them from below upwards, and the cartilage carefully divided upon that, in order to avoid wounding the chords. The parts are divided to such an extent that any wounded vessel is at once visible and can be secured. If the cartilages are ossified, cutting forceps or strong scissors may be necessary. In most of these cases tracheotomy has been already performed to relieve the urgent dyspnœa, but if this is not the case, it should be performed as a preliminary part of the major operation described. (Mr. A. E. Durham, p. 100.)

Pseudo-Phthisis.—There are many cases which are quite indistinguishable from ordinary phthisis by their general symptoms, yet are not originally tubercular at all. They commence with a localised pneumonia, the patch of solid lung softens; a cavity may even be formed. The consequence of such breaking down of tissue in ever so small a portion of lung is that dying and dead organic matter are brought into constant relation with living structures. It has been indisputably proved that the inoculation of putrescible matter is followed by lesions indistinguishable from tubercle of the lung. Cases of this kind show how careful we should be to thoroughly cure all cases of local inflammatory mischief of the lungs before the ordinary occupations are resumed. (Dr. A. E. Sansom, p. 68.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

Cancer of the Tongue.—*Removal of the Entire Tongue by the Galvanic Ecraseur.*—There are two modes of amputation of the tongue. 1. That in which the deep attachments to the hyoid bone are separated. 2. A rather more restricted operation, in which the wire of the écraseur is introduced through the mouth instead of through the skin under the lower jaw, as in the more serious operation. This operation is one of almost absolute safety. It may be best effected by the galvanic écraseur, which only differs from an ordinary instrument in that a current of electricity can be passed through the wire so as to heat it to redness. If the wire is tightened slowly so that it burns its way through the structures included by it, little or no hemorrhage occurs. The rule should be, the less resistance the slower the speed, and *vice versâ*, the resistance being in an inverse ratio to the vascularity. (Mr. W. Whitehead, p. 117.)

Digested Milk.—In cases of extreme emaciation, with inability of the stomach to digest food, the use of milk already digested offers the best means of supplying nutriment to the system. The following is the formula for its preparation:—Cow's (or better, for infants, asses') milk, five ounces; bullock's pepsine, five grains; dilute hydrochloric acid, thirty minims. Digest for two hours, at a temperature of 122° Fahr., by means of a water bath; after which the acid should be neutralised by the addition of twelve grains of carbonate of soda; and any slight bitterness covered by the addition of a little sugar. (Sir Wm. Jenner, Dr. W. Carter, Man. and L'pool Med. and Surg. Rep., 1873, p. 43.)

Fissure of the Anus.—In the upper part of the fissure we now and then find a little protruding polypoid growth of simple granulation-tissue springing up from the bottom of the ulcer. If that is left, a risk is run that the patient will not be cured. The growth may be clipped away with scissors, or scratched away with a knife without fear of hemorrhage. (Mr. C. Heath, p. 126.)

Hemorrhoids.—*Nitric Acid.*—It is not all cases which are suitable for this treatment. Large rounded vascular excrescences should be treated by ligature. It is in cases where, when the finger is passed into the bowel, and a peculiar velvety feel at one portion is felt, that nitric acid is required. This velvety piece of mucous membrane is exceedingly vascular, and bleeds even with the touch of the finger. Nitric acid may be used for one single pile—but a large spongy mass it is out of the question. (Mr. C. Heath, p. 122.)

External Piles.—Make an incision into the purplish mass and turn out the clot contained in it. The incision should be made in a direction radiating from the anus. If this is not done you run a risk of suppuration, or the formation of troublesome loose folds. (Mr. C. Heath, p. 122.)

NEW HERNIA KNIFE.—Dr. Patterson, of Glasgow, describes a hernia knife which differs from Sir Astley Cooper's simply in the blunt-pointed part of the knife having a quarter turn given to it, so that the flattened point passes more readily under the stricture, while its breadth flattens and pushes the gut aside as the cutting part of the blade follows. In all cases he opens the sac. (Dr. A. Patterson, p. 120.)

PROLAPSUS ANI.—The mucous membrane simply may prolapse, or the whole rectum may come down; all the coats, the muscular, and it may be the peritoneal coat also. In such cases the peritoneal cavity has even been opened by the removal of the protruded part. If the prolapse is inveterate it must be treated by applying nitric acid in stripes down the prolapsed mucous membrane. Another plan is to remove some of the redundant skin by scissors and forceps. (Mr. C. Heath, p. 125.)

PRURITUS ANI.—A weak solution of carbolic acid (1 in 96 or 100) generally at once relieves the itching soreness. (W. B., p. 129.)

Soak a small piece of marine lint in carbolic lotion, introduce a small plug of it into the anus every night, letting the remaining portion form a pad outside. It will always give great relief. (Dr. J. Thompson, p. 130.)

SPECULUM ANI.—The most convenient speculum for the anus is a bivalve one, formed of two parts connected by a simple hinge. It has this advantage, that you can fix it open at any point, and it can be turned round in any direction. It also admits of examination by the finger of the parts exposed. (Mr. C. Heath, p. 121.)

AFFECTIONS OF THE URINARY ORGANS.

ACUTE BRIGHT'S DISEASE WITHOUT ALBUMINURIA.—There are cases, although they are very rare, in which there is acute Bright's disease without albuminuria. Dr. George Johnson has seen four such cases, three of which recovered, and the fourth was improving when it was lost sight of. There is structural change in the kidney in fatal cases of this kind, as proved by direct examination. No good explanation can be given. There is generally dropsy, and a low specific gravity of urine, which is small in quantity. (Dr. G. Johnson, p. 78.)

CATHETERISM.—*Selection of Positions for.*—The best position is for the patient to stand and the operator to sit. If fixity is wanted the patient can lean against some object. (Mr. W. F. Teevan, p. 149.)

DIABETES.—*Skim-milk Treatment.*—By the skim-milk treatment of diabetes, as is proved by a case related by Dr. A. S. Donkin, the disease may be radically cured. Seven or eight pints of skim-milk are to be allowed daily, divided into meals taken at regular intervals, and no other food of any kind whatever is to be taken, and no medicine is required. In one case the urine was of specific gravity 1040, and contained 27 grains of sugar to the ounce. In fifteen days the sugar had entirely disappeared, nor has it returned, although the patient has long since resumed his ordinary avocations. There was at first a considerable loss of weight, as much as fourteen pounds in twenty-eight days, notwithstanding the fact that the patient at the end of this period felt very much stronger and better. At the end of six weeks the patient was allowed solid animal food at breakfast, dinner, and supper, in addition to the skim-milk, which he drank largely at meals instead of water. Bran biscuits, gluten bread, and every conceivable variety of animal food with dry wines were by degrees added to the dietary. He was last seen in April, 1872, when he was in excellent health. (Dr. A. S. Donkin, p. 72.)

Diabetic Bread.—The prohibition of bread from the diet is complained of by diabetic patients more than that of any other article of diet. Gluten bread is exceedingly insipid, and bran bread, if pure, is nothing but lignine, and therefore innutritious. A bread consisting of 80 per cent. of gluten and 20 per cent. of bran nearly free from starch, and a very small quantity of butter, does not possess these disadvantages. It is a much closer approximation to ordinary brown bread than any other substitute now in use. (Dr. A. S. Donkin, p. 77.)

GOUT AND GRAVEL.—*Lithium Salts.*—Salts of lithium are far superior to salts of potassium as remedial agents in cases of gout and gravel. Numerous trials have led Dr. Garrod to the conclusion that by means of from 20 to 30 grains of citrate of lithium the urine can be kept as full in quantity, the specific gravity as low, and the freedom from sand as great, as from the use of from 120 to 180 grains of citrate of potassium; and that when under the influence of the lithium salts no debility is experienced, whereas the lowering is often well marked when the citrate of potassium is exhibited. (Dr. A. B. Garrod, p. 150.)

LITHOTOMY.—*Removal of Foreign Bodies from the Bladder.*—What is to be done if a foreign body in the male bladder cannot be extracted through the urethra—such as a piece of bougie encrusted with salts? The median operation of lithotomy is unquestionably the proper thing to do. There are some differences of opinion as to the best way of reaching the staff. Erichsen uses a rectangular staff in order that the exact position of the point where to enter the knife in the groove may be more easily judged of. All are agreed that the cutting edge of the knife should be directed upwards—that the first point of incision should be half an inch above the rectum, in the position the patient is in, and that the prostatic portion of the urethra should be dilated by the forefinger of the surgeon and not incised. (Dr. G. H. Porter, p. 135.)

LITHOTRITY IN CASES OF ADVANCED RENAL DISEASE.—Lithotrity may be performed with success in cases of advanced renal disease. Of course the suffering of the patient must be so great as to render some relief necessary. A pale, weak, and puffy-looking man suffering from advanced Bright's disease, by lithotrity obtained relief for the remaining nine months of his life. The stone was a large phosphatic one. Lithotomy would have been at once fatal. (Sir H. Thompson, p. 134.)

RESINA COPAIBÆ AS A DIURETIC.—Copaiba consists of an oil and a resin, and in the latter reside the diuretic properties of the drug. It is not certain invariably to act as a diuretic, but it generally does so, and the action is thus more striking than that of any other diuretic. Fifteen or twenty grains in mucilage and flavoured water should be given three or four times a day. It is particularly useful in cases of dropsy from cardiac or hepatic disease. (Dr. S. Wilks, p. 263.)

STRICTURE OF THE URETHRA.—A recent stricture may generally be cured by simple dilatation by means of soft flexible conical bougies with a small bulbous extremity; but a stricture of old standing presents too much resistance for such an instrument. In these cases Sir Henry Thompson uses conical steel bougies, two sizes smaller at the point than at two and a half inches higher up. Where a stricture is very small and tight, so that a mere succession of drops is the only means by which relief is attained, the smallest gum-elastic catheter which handicraft can produce should be tried. If this can be passed it should be tied in. If this cannot be passed, a very small silver catheter should be tried. The quickest way to proceed to a cure is then to keep the patient in bed, and pass a larger instrument as its predecessor becomes loose. (Sir H. Thompson, p. 140.)

Old Indurated Strictures.—The objection to rupture by Holt's dilators is that the benefit obtained is not very enduring. The best plan by far is division by means of a urethrotome. The best is Civiale's. First see that the stricture is sufficiently dilated to admit the passage of the bulb of the instrument, and for this purpose, if necessary, tie in a small gum-elastic catheter for forty-eight hours before the operation. The bulb of the instrument being passed through the stricture, the small knife is started from its groove and made to cut along the floor of the urethra by slowly withdrawing the instrument. Do not fear a complete and free incision, and press the blade firmly against the opposing stricture. Next introduce a No. 13 plated sound, which should go quite easily into the bladder, and then, on withdrawing it, pass a No. 11 or 12 gum-elastic catheter, well curved, so as to keep the point out of the incision. This is to be retained in the bladder eight and forty hours. (Sir H. Thompson, p. 141.)

The "Railway Catheter."—Take a No. 2 flexible catheter, cut it off at the eye, and insert a fine piece of catgut instead of stylet. Pass the catheter down to the stricture, and then cause the catgut to protrude. It is so fine and flexible it will usually pass the stricture, and the catheter may thus be run upon it into the bladder. A filiform bougie or No. 1 catheter may be substituted for the catgut. (Mr. P. J. Molony, p. 146.)

Impassable Stricture.—Do not conclude that a stricture is impassable until the perineum has been freely leeched. Four surgeons had failed to pass an instrument in a case, although the patient had been kept in bed a fortnight and freely purged; but directly blood had been removed, as recommended, a small instrument was passed into the bladder. (Mr. W. F. Teevan, p. 147.)

New Operation for the Relief of Retention of Urine from Impassable Stricture.—A stricture is funnel-shaped, with its widest end towards the bladder and its narrow end outwards. In cases of retention which cannot be relieved without operative interference, the urethra may easily be opened from the rectum and a catheter passed into the bladder. It is usually easy also to pass a small instrument forwards through the stricture itself, and make it emerge at the orifice of the urethra. This operation is rendered easy by the dilated state of the passage behind the stricture. There is no danger of producing a rectal fistula, as the wound readily heals if a catheter is frequently used. This operation is simpler and safer than perineal section. (Mr. F. Jordan, p. 144.)

Retention of Urine from Stricture or Enlarged Prostate.—In the great majority of cases relief can be obtained by placing the patient in a warm bath and injecting subcutaneously one-eighth of a grain of acetate of morphia when he is in the bath. If this fails, give a full dose of castor oil and tincture of opium, followed by another hot bath. When compelled to use instruments chloroform is of inestimable service. (Dr. G. H. B. Macleod, p. 147.)

AFFECTIONS OF THE BONES AND JOINTS, OPERATIONS, &c.

Effusion in Joints.—*Removal of by the Aspirator.*—Although some of the forms of joint effusion are transient in character and readily yield to appropriate treatment, others are obstinately persistent, or are the precursor, if not the chief factor in the production of ankylosis, or which lead to excision and amputation. In these cases the proper practice is at once to draw off the fluid by means of the aspirator. (Mr. T. R. Jessop, p. 90.)

Excision of the Elbow-joint.—A limited removal of the bones in excision of the elbow-joint is usually followed by bad results as regards the mobility of the new joint. This want of mobility, however, depends upon a gradual contraction of the muscles of the joint, resulting from their too free separation from their attachments during the operation. In cases of ankylosis without disease such free exposure and removal as is usually practised are not necessary. All that is wanted is the removal of only a portion of the lower extremity of the humerus, together with any new osseous material likely to interfere with the future mobility of the joint. This may be effected by a mode of operating described at length in the paper. (Mr. T. Annandale, p. 85.)

Talipes Varus.—For a new method of bandaging in talipes varus, to prevent the heel slipping backwards and upwards, as recommended by Mr. Frederic Clowes, see description and woodcut at p. 99.

Tapping and Exploration of Tumours and Collections of Fluid.—*Pneumatic Aspirator.*—The pneumatic aspirator is a powerful syringe, made of glass with brass mountings, or of metal with a glass tube laterally placed and connected with the interior of the syringe for the purpose of observing the nature of the contents of the syringe. There are a number of fine tubular needles fitting on to the syringe. A vacuum must first be produced by closing the two taps and screwing or drawing up the piston to the full extent. A tubular needle must first be introduced into the tissues for about one-third of an inch, it must then be connected with the pump in which the vacuum has been established either directly or through the medium of a caoutchouc tube. The tap must then be opened between the needle and the vacuum and the needle pushed gently forward. We may thus slowly traverse the tissues, so to speak, with the vacuum in hand, until we discover the effusion, or abscess, or fluid of any kind we are in search of. The moment the needle enters the liquid the latter rushes forcibly into the instrument. (Mr. T. R. Jessop, p. 90.)

The subcutaneous injection syringe, or an instrument of similar construction, may be made of the greatest use in exploring suspected tumours, cysts, and abscesses in all parts of the body. By it the chest may be explored in pleuritic effusion, the peritoneal cavity, and various abdominal tumours and cysts. Dr. Roberts has explored the liver seven times in malignant disease of that organ, four times in cirrhotic induration, twice in albuminoid or waxy enlargement, five times in hydatid cysts of that organ, the spleen, and the kidneys, in cases of disease. In none of these cases did the smallest ill effect arise. (Dr. W. Roberts, p. 96.)

A New Mode of Tapping in Ascites.—All that is necessary is to insert a fine hollow needle, such as is used for a subcutaneous injection syringe, or better, a little larger. The needle should have attached about three and a half feet of india-rubber tubing filled with water. The syphon power thus brought into action is sufficient to empty accumulations of twenty or thirty pints in the course of some hours. It is better that a needle used for this purpose should have a cross-bar at the hilt, over which strips of adhesive plaster may be passed to keep it *in situ*. (Dr. W. Roberts, p. 96.)

AFFECTIONS OF THE SKIN.

Boils.—*Alcohol.*—As soon as the characteristic redness appears, indicative of the commencement of one of those small boils or abscesses which often so seriously impair the beauty of the face in young people, the spot should be rubbed with camphorated alcohol, the friction being continued some time. A little camphorated oil should then be applied to prevent complete evaporation. (M. Nelaton, p. 168.)

Itching and Irritation of the Skin.—*Bismuth as an External Application.*—An ointment containing bismuth in the proportion of half a drachm of the subnitrate to the ounce of simple ointment, rubbed up with a little spirits of wine, and applied freely to the skin, gives great relief in the intense itching and irritation which accompanies chronic eczema and other forms of skin disease. (Dr. McCall Anderson, p. 252.)

Skin-Grafting.—The following plan retains the graft well in its place, and yet does not necessitate the removal of the plaster to observe progress made. Cut an oval aperture in a strip of adhesive plaster sufficiently large to go across the wound and adhere well at each side of it. Place evenly and neatly on the adhesive side a shorter piece of gutta percha tissue. The whole is so to be adjusted that the graft is seen through the gutta percha tissue which closes the aperture in the adhesive plaster. (Dr. J. W. Bligh, p. 167.)

Small Abscesses and Cysts.—*Evacuation by a Subcutaneous Injection Syringe.*—Small abscesses and cysts may be easily evacuated by a subcutaneous injection syringe. This plan is particularly useful in small abscesses of the neck, when it is desirable to avoid unsightly scars. (Dr. W. Roberts, p. 96.)

Ulcers.—Take of flour, four ounces; powder of acacia, one ounce; powder of tragacanth, half an ounce; one egg; chalk, two drachms; cold water, one pint. Mix together and place on the fire in a saucepan. After boiling a minute remove, and allow to cool. It should be the thickness of ordinary paste. Let the patient paint the ulcer pretty thickly with this mixture three or four times a day, and cover with a piece of soft rag. No other treatment is to be pursued. The pot and brush used should be washed daily, and only enough material supplied to last for that one day, otherwise the contents will ome sour. By this treatment a number of old ulcers in broken-down people in a workhouse infirmary were cured in from two to six weeks. The theory of the treatment is that the application nourishes locally the weakened and degenerate spots. A number of illustrative cases are given, and whatever doubt there may be as to the theory, there can be none as to the success of the practice. (Mr. P. Corwen, p. 165.)

Vaccination.—Be careful never to drain a vaccine pustule of all obtainable lymph. As soon as the first contents are exhausted the risk of drawing syphilitic virus from the blood (supposing such to exist) begins. It is well to avoid vaccinating from children whose parents are not known to the vaccinator, and, further, to decline, for the most part, using all first-born children, waiting until, by the development of one healthy child, a guarantee of freedom from taint on the part of the parents has been given. (Mr. J. Hutchinson, p. 171.)

AFFECTIONS OF THE EYE.

Amaurosis.—*Hypodermic Use of Strychnia.*—In cases of hemeralopia, muscular asthenopia from overwork, amblyopia, and tobacco amaurosis, the hypodermic use of strychnia affords our best hope of success in treatment. It is not necessary to inject it near the organ affected, as the remedy acts only through the instrumentality of the nerve-centres and by means of the circulation. The solution should be four grains to the ounce, each minim of course containing $\frac{1}{120}$th of a grain. Three minims should be the commencing dose, equal to the one-fortieth of a grain. If no marked symptoms ensue, the amount of the solution used should be increased daily by one minim, until a maximum dose is reached, which is frequently one-sixth or even one-fifth of a grain. (Dr. J. J. Chisolm, p. 52.)

Cataract.—It is generally acknowledged that the cornea is much more prone to take on suppurative inflammation than the opaque tissue which constitutes the border land between the cornea and sclerotic. There are, however, certain risks in this operation, but they may be avoided when they are fully recognised. The risks are—1st. Greater liability of vitreous humour to escape; 2nd. Proneness to secondary iritis; and, 3rd. Possibility of sympathetic ophthalmia. The cause of the first is usually some spasm or pressure at the moment of exit. Secondary iritis depends usually upon some bruising of the iris, and sympathetic ophthalmia is probably due to an encroachment of the section upon the ciliary nerves, and a consequent bruising of that highly sensitive tissue during the transit of the hard cataract. (Mr. G. Critchett, p. 158.)

Section of the Orbicular Muscle and Integument at the Outer Canthus.—A section of the orbicular muscle and integument at the outer canthus as a prelude to operation for cataract is of great advantage. 1. The globe is more freely exposed. 2. The spasmodic contraction of the orbicular muscle is overcome, and consequently all risk of sudden protrusion of the lens, followed by prolapse of the iris, is avoided. 3. The contraction of the lids on the globe, which is sometimes a troublesome symptom in the after-treatment of cataract-extraction, is prevented. No sutures are required, as the divided surfaces readily unite, and scarcely leave a trace behind them. (Mr. E. Chesshire, p. 164.)

Removal of Cataract by Solution.—The experience of the late Dr. Arthur Jacob led him to treat all cataracts, with the exception of the yellow hard cataracts of elderly people, by simply breaking them up with a needle passed through the cornea. Under fifty years of age, the crystalline lens once broken in pieces must be sooner or later dissolved and absorbed. It is only a question of time. Absorption should always be preferred to operative measures for the removal of soft cataracts; the latter being in these cases very unsatisfactory. The extreme slowness of absorption, and the necessity for repeated disturbances of the eye are, however, disadvantages which prevent the frequent selection of solution instead of the more hazardous operation of extraction. Dr. A. H. Jacob, p. 160.)

Iritis.—*The Use of Atropine.*—The local application of atropine is alone sufficient to cure most cases of iritis. The strength of the solution is of little importance, provided it is not too weak. Four grains to the ounce is a good formula. The rule is that this should be instilled sufficiently often to dilate the pupil as quickly as possible, and this dilatation must be maintained during the whole progress of the inflammation, and even for several weeks after it has abated. For this purpose it is impossible to fix dogmatically the amount required. Warm applications are beneficial in iritis; cold applications injurious. (Mr. Leibreich, p. 252.)

Symblepharon.—*Conjunctival Transplantation from the Rabbit.*—In complete adhesion of the lid to the globe of the eye (usually the result of a burn by molten metal) all that is necessary is to restore the palpebral mucous membrane—the globe itself may be let alone. This may be done in two ways. 1. By transplanting two flaps from the conjunctiva oculi, one from either side of the cornea, twisting them, and bringing them down on to the inner surface of the eyelid. They must then be brought together in the middle line by fine sutures inserted previously to their separation from their natural place. 2. By transplanting a piece of conjunctiva from the eye of a rabbit. This has actually been twice successfully accomplished. (Dr. J. R. Wolfe, p. 153.)

MIDWIFERY, ETC.

Amenorrhœa.—*Junod's Boot.*—Junod's boot is essentially a dry cupping on a large scale. The leg is enclosed in an air-tight case, and the air exhausted over it. The result is that for the time the capillaries and vessels of the leg enlarge, more blood remains in the limb, and the circulation in other parts is proportionately relieved. It affords a mode of treatment in cases of suppression of the menses which is not only of great promise in itself, but has the merit of not interfering with other treatment. (Dr. E. Garrett-Anderson, p. 196.)

Guaiacum.—Guaiacum in ten-grain doses, once daily, is a remedy of considerable value in ovarian amenorrhœa, i.e., to stimulate the secretion when the uterus is healthy and the ovarion action is alone required. (Prof. Cleland, of Galway, p. 231.)

Cephalotripsy.—Perforate, and then apply the blades of the cephalotribe in the same manner as the long forceps. Screw the handles together and crush the skull, then repeat the process on the portion not previously included. It only remains to extract by means of the cephalotribe, using it just like a long forceps. It may be necessary to perforate and eviscerate the thorax and abdomen, and even to crush them with the cephalotribe. It may be requisite, in order to do so thoroughly to decapitate. (Dr. J. Wallace, p. 189.)

Chronic Endo-Metritis.—*Application of Nitric Acid.*—Although fluid injections into the interior of the uterus are highly dangerous, strong caustics may without fear be applied in suitable cases. Of these, the fuming nitric acid is by far the best. In order to apply this, first dilate the os and cervix very freely by tents, and then guard the cervix by a speculum contrived for this purpose (see woodcut p. 261.) The nitric acid is to be passed up by means of a stilette having a little cotton or lint rolled around it. It is seldom that any pain is caused. If the cervix is not guarded in the manner recommended contraction of its canal might ensue. This treatment is of great service in cases of profuse menstruation with rough granular membrane. In a case of chronic endometritis in which free dilatation of the cervix could not be done, on account of the distance of the patient's residence, ten grains of solid nitrate of silver were passed up into the interior of the uterus. A good deal of pain was caused, but the case was cured. (Dr. L. Atthill, p. 175.)

Chronic Inversion of the Uterus.—The first thing to try in chronic inversion of the uterus is sustained elastic pressure. For this purpose an inflated caoutchouc pessary in the vagina possesses several disadvantages. A better plan is to use a curved stem pessary with an elastic cup-shaped end. To the lower end of the stem are attached strong elastic tubular bands, two of which are brought up in front and two behind, to be made fast to a belt around the abdomen by bracing up the posterior bands. A forward direction is given to the elastic cup, so that the uterus is pressed up steadily upon the fundus of the vagina. If this plan does not make any impression, and the contracted os does not yield, the uterus should be pulled down outside the vulva by a noose of tape passed round it, and three shallow incisions made in the cervix, commencing at the os and extending about two-thirds of an inch downwards. The elastic pressure if now reapplied will probably succeed; if not, more forcible, but still gentle, pressure by the hand will usually succeed in returning it. (Dr. R. Barnes, p. 209.)

Fibroid Degeneration of the Cervix Uteri.—In this affection there is an increase both in length and bulk of the cervix and distinct firm nodulations are felt. The os is patulous, its lips everted, and the lining membrane congested, inflamed, and granular. There is generally leucorrhœa, which may be offensive, and more or less pain. The disease is very liable to be mistaken for cancer. By the entire removal of the morbid structure the disease may be cured. This is best effected by the cautious use of potassa fusa, after two or three applications of which the white colour of the fibroid deposit is seen contrasting strongly with the surrounding red normal tissue. Once exposed, it is pushed forward by contraction of the muscutar fibres surrounding it and becomes a projection when it may be brought under the action of the potash until the whole is removed. The caustic can be used with great safety and accuracy of limit if the proper mode of doing so is adopted. (Dr. P. Smith, p. 214.)

Fibroid Tumour of the Uterus.—A fibroid tumour of the uterine wall not presenting any marked projection into the cavity, is curable by a simple incision into it from within the uterus. The capsule is divided, and the uterine fibres contract upon it and expel it in the place of least resistance—the incision. Two interesting cases illustrative of this are related. The first tumour is described as six inches long by three, the second as weighing 27 ounces. (Mr. W. R. Jordan p. 211.)

Subcutaneous Injection of Ergot.—In a case of fibrous tumour of the uterus, not admitting of surgical interference, three grains of the watery extract of ergot was administered subcutaneously for fifteen days. The result was that the tumour began to diminish in size, and five weeks after the commencement of the treatment had altogether disappeared. The extract was dissolved in glycerine. The most convenient part is the vicinity of the umbilicus. After this singularly successful case, the same treatment was adopted in nine others, and was successful in seven. (Prof. Hildebrandt, p. 195.)

Flexions of the Uterus.—Anteflexion and retroflexion are produced by the same thing, namely, a subincumbent weight pressing on an enlarged and softened organ. If the position of the uterus is high up in the pelvis, anteflexion is produced, if low down retroflexion is produced. The reason is, that the axis of the uterus is always at right angles to the plane of that part of the pelvis in which it is situated, so that a weight would press upon the anterior surface if there is a little prolapse, and upon the posterior surface if the organ occupies its normal position. (Dr. Squarey, p. 213.)

Induction of Premature Labour.—There is no plan superior in efficiency and safety to that recommended by Dr. Barnes, for the purpose of inducing premature labour. It is to introduce into the uterus, external to the membranes, a portion of gum elastic bougie about six inches in length, the remainder being coiled up in the vagina; the sole disadvantage is that it is liable to slip out. This may be prevented by attaching an air pessary to the lower extremity of the bougie. The pessary is not inflated until it has been introduced into its proper position in the vagina. There is also this advantage that the air pessary acts as a dilator on the vagina, and facilitates the subsequent delivery. (Mr. W. Whitehead, p. 182.)

Insufflator for Diseases of the Uterus.—Mr. Clay, of Birmingham, describes an insufflator which he has for some time used in diseases of the uterus with satisfaction to himself; it is a tube of the same length and shape as Simpson's sound, having an india-rubber ball at the handle. There is an aperture in the tube near the ball, into which the powder used is introduced. It is made by Messrs. Salt & Son, Birmingham. (See woodcut, p. 229.)

Intra-Uterine Medication.—It must be remembered that if the uterus is tender on pressure, any intra-uterine application is likely to aggravate mischief instead of relieving it. The congested state must then be relieved by rest, the application of leeches, the introduction into the vagina of a pledget of cotton wool thoroughly soaked in glycerine, and other suitable means. The glycerine causes a profuse watery discharge, by exosmosis, relieving the congestion materially. (Dr. W. S. Playfair, p. 219.)

The best way of applying medicaments to the interior of the uterus in cases of chronic uterine catarrh is by means of a series of very fine probes made of soft metal, two and a half inches long, and mounted on long box wood handles. The extremity is very slightly bulbous. The flexibility of the probes is of essential importance, as it enables us to bend them to the exact shape of the uterine cavity. A small quantity of fine cotton wool is then teased out, the probe dipped in water to cause the wool to adhere, and the wool then wrapped evenly round the probe by rotating the latter while the wool is held between the finger and thumb of the left hand. The cervix is next exposed by a Ferguson's speculum and the probe, dipped in whatever solution is to be used, gently passed up into the uterine cavity. No force is to be employed. The most useful of all aplications is a solution of carbolic acid in glycerine. Carbolic acid possesses certain properties which particularly recommend it for this purpose. When applied in a tolerably concentrated form it causes the tissues to shrink and mummify, but they never swell, nor is an eschar ever produced. There is no tendency to cause stricture of the uterine canal as there is when solid nitrate of silver is used. (Dr. W. S. Playfair, p. 222.)

Fluid injections into the interior of the uterus are so dangerous that their use should be restricted to urgent danger from menorrhagia. One of the most useful applications, and at the same time safe and convenient, is sulphate of zinc. It can be prepared in small cylindrical sticks, weighing three and five grains. These can be carried into the uterus by means of a silver canula, like a catheter with the end cut off. When in the proper place the zinc is ejected by means of a stilet. Nitrate of silver reduced by admixture with nitrate of potash may be used in the same way; so may persulphate of iron, but this should be considerably reduced. Almost any substance may be applied in the form of an ointment or pasma. When grease is objectionable a pasma made of glycerine and other matters may be used. (Dr. R. Barnes, p. 224.)

Seeing that dangerous symptoms not unfrequently arise from fluid injections into the uterus, it is better to employ the safe and equally efficacious solid forms of the drugs usually used in the liquid form. Finely powdered nitrate of silver, sulphate of zinc, or perchloride of iron may be applied with the greatest ease by means of Lallemand's porte-caustique. The drug is placed in the groove of the stylet, and this is protruded and rotated on arrival within the uterine cavity. (Dr. J. Whitehead, p. 230.)

Menorrhagia.—*Sponge Tents.*—We occasionally meet with cases of menorrhagia for which there is no apparently sufficient cause—no polypus, no tumour or disease of the body of the uterus. The cervix, however, is thickened, the os patulous, and the mucous membrane soft, spongy, and granular. Often one lip is much swollen, but the one peculiar characteristic is that the mucous membrane feels loose, and can be glided a little over the subjacent structures by the finger. These cases are generally in women who have lately returned from India, or have lately had a miscarriage or delivery at full term. The hemorrhage is very uncontrollable. The local use of perchloride of iron does not suffice. The best plan is to dilate the parts with a well made sponge tent. If no gum is used in the manufacture the sponge presses evenly and firmly on all the inequalities of the mucous membrane, modifying its nutrition. Whatever the explanation may be the remedy answers the purpose. (Dr. G. G. Bantock, p. 191.)

New Midwifery Forceps.—Dr. Vacher, of Birkenhead, describes a new form of short midwifery forceps (see woodcut, p. 187). Like those described by us in 1868, the two blades lie one inside the other, and are introduced as one blade directly into the hollow of the sacrum. They are then separated and passed round the head of the child in opposite directions. The two blades are connected together firmly by a hinge joint at the handle. When brought opposite to nother they lock of themselves. The forceps are only intended to be used when the head is low down in the pelvis. It is made by Weiss and Son. (Dr. F. Vacher, p. 185.)

THE ORIFICES OF THE UTERUS.—The uterine sound ought not in a healthy uterus to pass through the os internum without pressure, or in other words a certain amount of force. This is owing to the physiological contraction of the circular fibres of the os internum. These fibres are not anatomically a sphincter, but they are one practically. Hence the division of them by any of the numerous instruments made for that purpose is in most cases an unscientific and useless operation. (Dr. H. Bennet, p. 206.)

The os uteri internum is actually open so as to admit the uterine sound only as a rule in morbid uterine conditions, especially where there is inflammation of the mucous membrane of either the cervix or body. A patent os internum is also found in sub-involution and in cases of fibroid tumours. In some women of very lax fibre the sound meets with no resistance, without the existence of any uterine disease. It results from all this that if we cannot pass a sound we must not suppose there is organic stricture—the contraction being physiological and quite healthy. (Dr. J. H. Bennet, p. 205.)

LACTO-PHOSPHATE OF LIME.—How is it that in rickets, osteomalacia, and fractures of bones, no great success follows the administration of phosphate of lime? Because the pulverised phosphate is used, of which the natural solvent is lactic acid. Owing to the small amount of lactic acid present in the gastric juice very little of the lime salt is dissolved, and nearly all passes off by the bowels. The proper preparation is a syrup, containing phosphate of lime completely dissolved by a sufficiency of lactic acid. The necessity of lacto-phosphate of lime to the organism is not at all understood. It is so necessary that the system languishes and wastes without it. Phosphate of lime is a constituent of all albuminoid substances, and is contained in equal abundance in seeds and all growing vegetable substances, whilst it is almost absent in the fully-formed wood. Why should a growing shoot contain this substance? A growing child requires it as much, and many cases of debility and wasting in children are curable by its administration, as it is a general stimulant to nutrition, improving the appetite and imparting vigour to the system. (M. Blache, Paris, Practitioner, Feb. 1872, p. 65.)

POST-PARTUM HEMORRHAGE.—*Injection of Perchloride of Iron into the Uterus.*—The strength of the solution used should be one in ten. The Americans prefer persulphate of iron. This may be used in the form of one part of the liq. ferri persulphatis of the British Pharmacopœia to six or eight of water. (Dr. R. Barnes, p. 226.)

PROLAPSUS UTERI.—The simple ring pessaries introduced by Dr. Graily Hewitt are by far the best ever brought into practice. This instrument is merely a copper wire ring coated with gutta percha, and of various diameters. It can be moulded into any shape, thus being suitable for all cases, whether anteversion, retroflexion, or prolapse. (Dr. C. R. Drysdale, p. 207.)

Treatment of Prolapsus Uteri without Mechanical Means.—Having replaced the uterus, with the aid of the speculum paint the fold of the vagina surrounding the os with tincture of iodine, diluted with an equal amount of alcohol. Let the patient remain in bed, and have an injection four times a day of pure spring water, of the temperature of 48°, or thereabouts. The painting is then to be repeated, followed by the douches. After this it is not generally necessary for the patient to remain in bed, but the treatment should be continued. (Dr. N. Andreef, p. 208.)

MISCELLANEA.

ANÆSTHETICS.—One death in 2872 cases occurs from the use of chloroform, whereas only one in 23,204 occurs from the use of ether. (Dr. Coles, p. 236.)

Combination of Cloroform and Ether.—When these two agents are combined one never knows what one is about. It is, however, an excellent plan to begin with chloroform: and as soon as the pulse shows signs of failure to commence the administration of ether, and continue its use until the pulse is restored, or as long as the patient remains quiet enough for the performance of the operation. By this plan it is probable that the cases of unavoidable deaths from cardiac failure resulting from chloroform might be averted. (Dr. T. Jones, p. 246.)

Ether.—Ether is given at the Middlesex Hospital mixed with air. Air is passed over ether heated to 70°. Inhalation in one case was continued an hour with no bad results of any kind. (Mr. G. E. Norton, p. 240.)

The vapour of ether is highly inflammable, it should therefore never be used in any case where actual cautery may have to be employed about the face. If this is not observed a disastrous accident will some day occur. (Mr. J. Hutchinson, p. 243.)

The ether used must be pure, and what is termed anhydrous, and it may either be administered by Dr. Morgan's apparatus, or by means of a napkin or sponge. If a sponge is used it should be a cone-shaped one, and should be placed over the mouth and nose before any ether is poured on it. An ounce or more of ether should then be poured on the summit of the sponge and the operator should then with both hands carefully exclude the admission of air from the sides. All that is further necessary is to encourage the patient to breathe freely, and to keep on adding ether without stint, and if excitement occurs to hold the sponge firmly and increase the amount of ether. As a rule, throughout the administration the pulse keeps full and bounding, and the face is flushed. There is never any collapse, pallor, or any dangerous symptoms. It is however not probable that ether will take the place of chloroform, but will be used where the latter is inadmissible. By using it in conjunction with chloroform the danger of the latter is very much diminished. (Dr. C. B. Taylor, p. 235.)

A large conical hollow sponge covered with waterproof jaconette is the best inhaler. About one ounce should be placed in the sponge which is held tightly over the face. An ounce and two-thirds is required to produce anæsthesia in a child, two ounces and one-third in an adult. This forms an average of fifty cases, out of which vomiting occurred thirteen times. The advantages and disadvantages of ether and chloroform seem to be so nearly balanced that the question as to which should be used appears to be one of safety only. If experience should prove that ether really is the safer then it should be preferred, but if not, then chloroform is the best, as being both cheaper and easier to administer. (Mr. A. F. McGill, p. 239.)

Dr. Morgan's Ether Inhaler.—A very good form of apparatus for inhalation of ether is that of Dr. Morgan, of Dublin. It consists of a circular box, having a large central aperture in the upper flat surface. This aperture is rendered air-tight by a flexible membrane which rises and falls with the respiration of the patient. The ether is poured in through a small side aperture, and its vapour is breathed over and over again by the patient. There is a mouth piece with flexible tube. Great saving of ether is effected. (Dr. J. Morgan, British Medical Journal, Nov. 23, 1872.)

Nourse's Ether Inhaler.—This consists of simply a cone of card-board, two or three inches in depth, made so as to cover the mouth and nose with comfort. A flat sponge is inserted into and covers the upper end of the cone. (p. 245.)

Chloroform Administration.—Mr. Clover states that, since adopting the plan of measuring the chloroform and air, so as to insure that there shall not be more than three minims and a half in each hundred inches of air, his experience of chloroform has been so favourable that he has never felt the need of another anæsthetic on the ground of safety. The tendency to produce cardiac syncope increases with the dose. Some surgeous think that it is only necessary to watch the respiration during anæsthesia, from chloroform. This is a mistake. It is the pulse which should be kept carefully under observation. (Mr. J. T. Clover, p. 246.)

Whenever chloroform is administered from a handkerchief or sponge it should be diluted with one or two parts, by measure, of spirit of wine or eau de Cologne. The spirit lowers the elastic force of the vapour of chloroform, and diminishes the amount of vapour which is given off in a given time, thus lessening the danger. (Mr. B. W. Richardson, Dr. Snow, p. 243.)

Treatment of Chloroform Poisoning.—At once commence artificial respiration by Sylvester's method. Standing behind the patient, seize his arms just at the elbows and press them firmly against the sides of the thorax, and then slowly and gradually and firmly draw them directly above the patient's head. Each time this is done properly the noise of inspiration will be heard. It should be done very deliberately, and about fifteen times a minute—if more rapidly all ingress of air into the windpipe is prevented by closure of the vocal chords. This has been ascertained by direct experiment. The patient's heat must be maintained by blankets and a hot bottle, and the diaphragm must be brought into action by means of one pole of a battery applied over the phrenic nerve, and the other on the right side of the thorax on the sixth or seventh interspace. This is done in order to avoid the heart. The rheophores must be well moistened and pressed well down. These measures invariably succeed in producing respiration, and must not be relaxed for at least an hour and a half. (Dr. G. V. Poore, p. 248.)

Methylene Ether.—When absolute ether and pure bichloride of methylene are mixed in equal parts a rise of temperature occurs, and a new chemical compound is produced—probably a combination of the radical ethyl with methylene bichloride. This liquid is the same sp. gr. as water, and boils at 90° Fahr. It has a peculiar odour of its own, less pungent than that of chloroform. It is a very rapid anæsthetic. The sleep induced is gentle, and is very rarely attended with convulsive movement. Vomiting is very rare. It is probably equally safe with ether, over which it possesses many advantages. (Dr. B. W. Richardson, p. 233.)

Methylene ether is actually cheaper than chloroform. It is much superior to sulphuric ether, as it is pleasant to take, and a much less quantity is required. (Mr. L. Tait, p. 234.)

Death from Nitrous Oxide Gas.—The death which has occurred from the inhalation of nitrous oxide gas clearly proves that the assertion, so constantly made, that nitrous oxide gas does not affect the heart, is without foundation, for the first symptom was rapidity of pulse with diminution of volume. The immediate cause of death, however, was paralysis of respiration. There was no obstruction of the air passages, but the patient was powerless to inspire. (Ed. of the Lancet, p. 250.)

Apomorphia as an Emetic.—Apomorphia is probably the best emetic known. It is administered by subcutaneous injection. It is more rapid in its action than any other emetic, and perfectly safe, inasmuch as a dose larger than necessary does not produce corresponding effects. In cases of poisoning in children, or in insane persons, and where there is coma or loss of consciousness, it will be at once seen how valuable an addition this drug is to our materia medica. (Riegel and Bœhm, Glasgow Medical Journal, May, p. 362.)

Hypodermic Injections.—Push the needle through the integument (which has been pinched up for that purpose on the arm or shoulder) to the extent of three-quarters of an inch, and then withdraw the point a short distance before injecting the solution. If air is drawn into the syringe in filling it, the instrument should be inverted, and the piston pushed in, till all the air is forced out. (Ed. of Canada Lancet, Medical Press and Circular, Dec. 11, p. 514.)

Iron.—In iron we have two kinds of value; its value in ordinary small doses and in mild forms, when it removes simple anæmia; and its value in large doses—doses such as half a drachm to a drachm of carbonate of iron, or twenty to thirty drops of the sesquichloride tincture—when it seems, apart from the presence of any definite anæmia, to have a special effect in modifying the morbid state of nerve tissue. (Dr. T. C. Allbutt, p. 41.)

Narceine as a Narcotic.—While morphia and narceine produce sleep, narcotine and thebaine produce convulsions and cramps. Narceine is a most valuable drug. It is better adapted for the purpose of inducing sleep than morphia, and it is entirely free from all excitant action, and acts as a pure narcotic. It is best administered hypodermically on account of its high price. One-eighth to one-quarter of a grain is the proper dose to inject. (M. Eulenburg, p. 257.)

Poisoning by Aconite.—In a case related by Mr. Dobie, of Keighley, the treatment pursued was the subcutaneous injection of twenty minims of tincture of digitalis, and the application of galvanism to the cardiac region. The patient appeared dying when this was commenced. In twenty minutes he was able to swallow, and a mixture of ammonia, brandy, and a teaspoonful of tincture of digitalis was given. The patient recovered. The chief effect of the aconite was to depress the circulation, and digitalis with stimulants seems the natural antidote. (Mr. W. Dobie, British Medical Journal, Dec. 21, p. 682.)

POISONING BY OPIUM.—*Atropine as an Antidote.*—In cases of profound coma from opium poisoning half a grain of atropine injected produces its full effect in two hours. The pupils, however, begin to dilate slowly in from ten to twenty minutes, and after an hour or more the face becomes flushed, the respiration soft without stertor, and the pulse stronger. If the coma is less profound a quarter of a grain may suffice. (Dr. J. Johnston, Shanghai, p. 255.)

QUININE.—Quinine may be administered in doses of one grain as a simple tonic, or in doses of ten to thirty grains as an anodyne. (Dr. T. C. Allbutt. p. 41.)

SMOKING.—*Absorption of Nicotine in.*—Three can be no doubt but that nicotine is actually absorbed into the system from smoking tobacco, and particularly cigars. It is found that 4,500 grammes of tobacco smoke passed through water yield 30 grammes of nicotine. (Dr. C. R. Drysdale, p. 264.)

INDEX TO VOL. LXVII.

PAGE
Abscesses, small, M. Nelaton's treatment by alcohol . . . 168
Actæa, its use in the treatment of lumbago and rheumatism . . 31
Acupressure, Dr. Wills' modification of 111
Acute spinal meningitis, Dr. Wilks on a case of . . . 44
Albuminuria, Dr. Johnson on 79
Alcock, Mr. N., on blood-poisoning in man and animals . . 32
Alcohol, Dr. Dickinson on, as a cause of renal disease . . . 82
Allbutt, Dr. T. C., on certain forms of visceral neuralgia . . 39
" " on ovaralgia and its treatment . . . 227
Amblyopia, hypodermic use of strychnia in 52
Amenorrhœa, Dr. Garrett-Anderson on Junod's boot as a remedy in . 196
" Professor Cleland on the use of guaiacum in . . 231
Ammonia in workshops as a preventive of mercurial poisoning . 257
Anæsthetics, Dr. Cole on the statistics of deaths from chloroform and ether 236
" Dr. Jeffries' statistics of deaths from chloroform and ether. 235
" Dr. Jones on 246
" Dr. Kidd on chloroform in "shock" . . . 250
" Dr. Kidd on the "stages" of anæsthesia . . . 241
" Dr. Morgan on the danger of chloroform and the safety of ether 236
" Dr. Morgan's ether inhaler 244
" Dr. Richardson on methylene ether, or ethyl . . 233
" Dr. Poore on the administration of chloroform . . 249
" Dr. Poore on the treatment of chloroform poisoning . 248
" Dr. Taylor on the respective advantages of ether and chloroform 235
" Editor of Lancet on a case of death from nitrous oxide gas 250
" Mr. Clover on the respective merits of ether and chloroform 246
" Mr. Couper on the administration of ether . . 238
" Mr. Hutchinson on the choice of 242
" Mr. Mackenzie on the administration of ether at the London hospital 240
" Mr. McGill on the respective advantages of ether and chloroform 239
" Mr. Norton on the administration of ether at the Middlesex hospital 240
" Mr. Richardson on a mixture of chloroform and spirits of wine 245
" Mr. Richardson's ether inhaler 243
" Mr. Rigden on the administration of ether at the University College hospital 241
" Mr. Tait on the advantages of methylene ether . . 234
" Nourse's ether inhaler 245

PAGE
Anchylosis, Mr. Annandale's mode of excising the elbow-joint for . 85
Anderson, Dr. McCall, his case of aneurism of the aorta treated by galvano-puncture 112
Andreef, Dr. N., on the treatment of prolapsus uteri . . . 208
Aneurism, Dr. Thompson's new mode of applying pressure in . . 110
" Mr. Holmes on the surgical treatment of . . . 105
" Dr. Mac Cormac's case cured by digital compression . 108
" of aorta, Dr. Anderson's case treated by galvano-puncture . 112
Annandale, Mr. T. his method of excising the elbow-joint in anchylosis 85
Anodyne colloid, Dr. Lackerstein on a new 262
Anstie, Dr. F. E., on lead poisoning 33
" " on the principles of treatment of migraine . . 37
" " on the use of ergot in the hemoptysis of phthisis . 63
Antiseptic surgery, Mr. Hamilton on the recent practice of . . 86
Apomorphia as an emetic, Riegel & Bœhm on 281
Arsenic, Dr. Allbutt on its use in gastralgia 41
Aspirator, pneumatic, Mr. Jessop on the surgical uses of the . . 90
Atropine, M. Leibreich on the use and abuse of 252
" as an antidote to opium, Dr. Johnson on 255
Atthill, Dr. L., on the application of nitric acid to the interior of the uterus 177

Ballard, Dr., on an outbreak of enteric fever at Nunney . . 23
Bantock, Dr. G. G., on the use of the sponge-tent for menorrhagia . 191
Barnes, Dr. R., on reduction of the uterus in chronic inversion . 209
" " on the essential cause of dysmenorrhœa . . 197
" " on the modes of applying remedies to the interior of the uterus 224
Bartlett, Dr. J. J. H., on the treatment of lumbago and rheumatism with actæa 31
Beck, Dr. S., on the causes of dysmenorrhœa 199
Bell's paralysis, Dr. Smith on the effect of electricity in a case of . 261
Bennet, Dr. H., on mechanical and forcible dilatation of the cervix uteri 205
Bismuth in intense itching and irritation from chronic eczema. . 252
Bladder, Dr. Porter's case of removal of a portion of a catheter from the 136
" Dr. Roberts on tapping by needle and syphon-arrangement . 98
" Mr. Jessop's case of tapping by the pneumatic aspirator . 95
" Sir H. Thompson on choice of operation for stone in the . 130
Bligh, Dr. J. W., his fenestrated non-adhesive plaster for skin-grafting . 167
Blood-poisoning in man and animals, Mr. Alcock on . . . 32
Boils, M. Nelaton's treatment of by alcohol 168
Bright's disease, acute, Dr. Johnson on the pathology and diagnosis of 78
Broadbent, Dr. W. H., on the value of phosphorus in certain nervous affections 48
Burow, Dr., on the use of chlorate of potash in cancerous sores . 263
Buzzard, Dr. T., his cases illustrating the employment of central galvanisation. 60

Cancer, Mr. Whitehead's removal of entire tongue by galvanic ecraseur 117
" rodent, Mr. Hulke on its treatment 35
Cancerous sores, Dr. Burow on the use of chlorate of potash in . 263
Camden, Mr. G. J. S., on carbonate of ammonia in scarlet fever . 23
Carter, Dr. W., on tincture of veratrum viride in acute rheumatism . 262
" " on the hypodermic injection of strychnia in paralysis. 50
Cataract, Dr. Jacob on the removal of by solution—keratonyxis . 160
" Mr. Chesshire on section of orbicular muscle and integument prior to extraction 164
" Mr. Critchett on the treatment of 158
" Mr. Leibreich on the use of atropine in operations for . 254
theterism, Mr. Teevan on the selection of positions for . . 149

PAGE
Cephalotripsy, Dr. Wallace's cases of 189
Cervix uteri, Dr. Bennet on the practice of forcible dilatation and division of the 205
" " Dr. Duncan on mechanical dilatation of the 204
Chesshire, Mr. E., on section of orbicular muscle and integument in extraction of cataract 164
Chisolm, Dr. J. J., on the hypodermic use of strychnia 52
Chlorate of potash, Dr. Burow on its use in cancerous sores 263
Chloroform, Dr. Morgan on the danger of, as an anæsthetic 236
" Dr. Taylor on its use in conjunction with ether 235
" Mr. Hutchinson on the danger of and precautions in administering 242
" Mr. Richardson on its mixture with spirits of wine for anæsthesia 245
" and ether as anæsthetics, Mr. Clover on 246
" in "shock," Dr. Kidd on 250
" poisoning, Dr. Poor on the treatment of 248
Cholera, Dr. Hodder on transfusion of milk in 25
Chorea, Dr. Wade on the treatment of 46
Chronic meningitis, Dr. Wilks's cases of 44
Clay, Mr. J., his insufflator for treating diseases of the uterus 229
Cleland, Prof., on the use of guaiacum in ovarian affections 231
Clover, Mr. J. T., on the respective merits of ether and chloroform 246
Clowes, Mr. F., on the treatment of talipes varus 99
Colles's fracture of the radius, Dr. Macdonald on its treatment 84
Conjunctival transplantation from the rabbit, Dr. Wolfe on 153
Consumption, Dr. Sansom on inflammation of the lung as a cause of 68
Cooper, Mr. G., on vaccination-syphilis 172
Cotton wadding, Dr. Reid on the French method of dressing wounds by 103
Couper, Mr. J., on the administration of ether 238
Cowen, Mr. P., on a new method of treating ulcers 165
Critchett, Mr. G., on the treatment of cataract 158

De Meric, Mr., on vaccination-syphilis 172
Diabetes, Dr. Donkin on the skim-milk treatment of 72
Dickinson, Dr. W. H., on alcohol as a cause of renal disease 82
Digitalis in dropsy 81
Donkin, Dr. A. S., on the skim-milk treatment of diabetes 72
Drasche, Dr., on the use of ergotine subcutaneously in hemorrhage 68
Dropsy, Dr. Wilks on resina copaibæ as a diuretic in 263
" use of digitalis in 81
Drysdale, Dr. C. R., on the absorption of tobacco smoke 264
" " on the treatment of prolapsus uteri 207
Dysmenorrhœa, Dr. Barnes on the essential cause of 197
" Dr. Beck on the causes of 199
" Dr. Playfair on the causes of 198
" Dr. Rogers on the causes of 201
" Dr. Tilt on the causes of 201
" Mr. Spencer Wells on the causes of 201
" spasmodic, Dr. Duncan on the nature of 203
Duncan, Dr. J. M., on the orifices of the unimpregnated uterus and their surgical treatment 202
Durham, Mr. A. E., on opening the larynx by section of the cartilages for removing morbid growths 100

Ecraseur, galvanic, description of the 118
Eczema, Dr. McCall Anderson on bismuth in itching and irritation of 252
Editor of the Lancet on vaccination-syphilis 173
Elbow-joint, Mr. Annandale on excision of in cases of anchylosis 85
Electricity, Dr. Anstie on its efficacy in lead poisoning 34

PAGE
Electricity, Dr. Smith on the use of the direct and induced currents of 261
" Dr. Wilks on the therapeutic uses of 258
" Editor of the Canada Lancet on 57
Endo-metritis, Dr. Atthill on the treatment of cases of 178
" Dr. Playfair on intra-uterine medication in . . 217
" Dr. Whitehead on its treatment 230
Enteric fever, Dr. Ballard on an outbreak of at Nunney . . 23
" Dr. Kennedy on the etiology of, in relation to the strumous diathesis 18
Epistaxis, Dr. Taffe's method of plugging the posterior nares for . 115
" Mr. Godrich's method of plugging the posterior nares for . 115
Ergot, Dr. Anstie on its use in hemoptysis 63
Ergotine, Dr. Drasche on its use subcutaneously in hemorrhage . 68
Ether, Dr. Morgan on its safety as an anæsthetic 236
" Dr. Taylor's practical observation on, as an anæsthetic . . 235
" Mr. Couper on the administration of 238
" Mr. Hutchinson on the advantages and disadvantages of . 242
" Mr. Mackenzie on its use as an anæsthetic at the London hospital 240
" Mr. McGill on 50 cases of anæsthesia in Leeds General Infirmary 239
" Mr. Norton on its use as an anæsthetic at the Middlesex hospital 240
" Mr. Ridgen on its use as an anæsthetic at University College hospital 241
" inhaler, Dr. Morgan's 244
" " Nourse's 245
" " Mr. B. Wills Richardson's 243
Excision of elbow-joint, Mr. Annandale's new method of . . . 85
Exploring and tapping, Dr. Roberts's apparatus for 96
" " Mr. Jessop on the use of the pneumatic aspirator for 90
Eye, Dr. Chisolm on hypodermic injection of strychnia in nervous affections of 52

Fever, Prof. Huter's mechanical theory of 24
" enteric, Dr. Ballard on an outbreak of at Nunney . . 23
" " Dr. Harley on its relation to scarlatina 21
" " Dr. Kennedy on the etiology of 19
" relapsing, directions of the Local Government Board on . 17
" scarlet, Mr. Camden on carbonate of ammonia in . . 23
Fibroid degeneration of the uterus, Dr. Smith on its treatment . 214
" uterine tumour, Mr. Jordan's cases of treated by enucleation . 211
Fibro-myoma of the uterus, Prof. Hildebrandt's treatment of . . 195
Fissure of the rectum, Mr. Heath on the treatment of 125
Fistula-in-ano, Mr. Heath on the treatment of 126
Flexions, uterine, Dr. Squarey on their causation and pathology . 213
Forceps, obstetric, Dr. Vacher's new 185
Foreign bodies in the male bladder, Dr. Porter on the removal of . 135
Fracture of the radius, Colles's, Dr. Macdonald on 84
Furunculi, abortive treatment of 167

Galvanism, Dr. Buzzard's cases treated by 60
" Dr. Poore on its influence over voluntary muscular action . 58
" Dr. Wilks on the therapeutical uses of 52
" Dr. Wilks on the therapeutical uses of 258
" Editor of the Canada Lancet on 57
Galvano-puncture, Dr. Anderson's case of aortic aneurism treated by . 112
Garrett-Anderson, Dr. Elizabeth, on Junod's boot in some forms of amenorrhœa 196
Garrod, Dr. A. B., on lithium salts in renal calculus, gravel, gout, &c. 150
Gascoyen, Mr. G. G., on vaccino-syphilis 175
Gastralgia, Dr. Allbutt on the treatment of 40

PAGE

Godrich, Mr. A., his mode of plugging the posterior nares . . 115
Gout, Dr. Garrod on the value of lithium salts in . . . 150
" Dr. Ord on its relation to uric acid 26
Guaiacum, Prof. Cleland on its efficacy in ovarian affections . . 231
Guarana powder, Dr. Anstie on its use in the treatment of migraine . 88

Hamilton, Mr. D. J., on recent methods of treating wounds antiseptically 86
Harley, Dr. G., on vaccination-syphilis 171
Harley, Dr. J., on the pathology of scarlatina and its relation to enteric fever 21
Headache, Dr. Silver on the use of ergot in 42
Heath, Mr. C., on hemorrhoidal affections 121
" " on polypus of the rectum, prolapsus, fissure, and fistula 124
Hemeralopia, hypodermic use of strychnia in 52
Hemoptysis, Dr. Anstie on the use of ergot in 68
Hemorrhage, Dr. Drasche on the use of ergotine subcutaneously in . 68
" surgical, Dr. Wills' modification of acupressure for arresting 111
Hemorrhoidal affections, Mr. Heath on 121
Hemorrhoids, external, Mr. Heath on the treatment of . . . 121
" internal, Mr. Heath on the treatment of . . . 122
Hernia knife, Dr. Patterson's 120
Hildebrandt, Dr., on the treatment of fibro-myoma of the uterus . 195
Hodder, Dr. E. M., on transfusion of milk in cholera . . . 25
Holmes, Mr. T., on the surgical treatment of aneurism in its various forms 105
Hulke, Mr. J. W., on rodent cancer 85
Hutchinson, Mr. J., on the choice of anæsthetics . . . 242
" " on vaccination-syphilis 168
Hyperæsthesia of the skin cured by galvanisation . . . 60
Hypodermic morphia, Dr. Albutt on the dangers of . . . 228
" injections, Editor of Canada Lancet on . . . 281

Impassable stricture, Mr. Jordan's new method of releaving retention in 144
" stricture, Mr. Teevan's successful case of . . . 147
Induction of premature labour, Mr. Whitehead's new method of . 182
Inflammation of the lung as a cause of consumption . . . 68
Insufflator, Mr. Clay's for treating diseases of the uterus . . 229
Intra-uterine medication, Dr. Barnes on 224
" medication, Dr. Playfair on 217
" injections, Dr. Whitehead on 230
Inversio uteri, chronic, Dr. Barnes on reduction of . . . 209
Iritis, Mr. Leibreich on the use of atropine in 252

Jacob, Dr. A. H., on keratonyxis, and removal of cataract by solution . 160
Jessop, Mr. T. R., on the surgical uses of the pneumatic aspirator . 90
Jones, Dr. T., on anæsthetics 246
Johnson, Dr. G., on the pathology and diagnosis of acute Bright's disease 78
Johnson, Dr. J., on atropine as an antidote to opium . . . 255
Jordan, Dr., his cases of uterine fibroid tumor treated by enucleation 211
Jordan, Mr. F., on retention of urine and impassable stricture . . 144
Junod's boot, Dr. Garrett-Anderson on its use in amenorrhœa . 196

Kennedy, Dr. H., on enteric fever in its relation to the strumous diathesis 18
Keratitis, Dr. Leibreich on the use of atropine in . . . 258
Keratonyxis, Dr. Jacob on the operation of 160
Kidd, Dr., on chloroform in "shock" 250
" " on the "stages" of anæsthesia 241

Labour, premature, Mr. Whitehead on the induction of . . 182

PAGE

Lackerstein, Dr., on a new anodyne colloid 262
Lacto-phosphate of lime in rickets, &c., Dr. Blache on 279
Larynx, Mr. Durham on section of the cartilages for removing morbid growths from 100
Lee, Mr. H., on vaccination-syphilis 172
Lead palsy, Dr. Smith on the effect of electricity in 258
" Dr. Wilks on the use of galvanism in 55
Lead-poisoning, Dr. Anstie on 33
Leibreich, Mr. R., on the use and abuse of atropine 252
Lithium salts, Dr. Garrod on use of in renal calculus, gravel, gout, &c. 150
Lithotomy, Dr. Porter on removal of foreign bodies from male bladder by 135
Lithotrity, Sir H. Thompson on 134
Lumbago, Dr. Bartlett on its treatment with actæa 31

MacCormac, Mr. W., his case of popliteal aneurism cured by digital compression 108
Macdonald, Dr. J. A., on the treatment of Colles's fracture of the radius 84
Macleod, Dr. G. H. B., on the treatment of retention of urine . . 147
Menorrhagia, Dr. Atthill on the treatment of 178
" Dr. Bantock on its treatment by the sponge-tent . 191
Mercurial poisoning, Dr. Meyer on ammonia as a preventive of . 257
Methylene ether, or ethyl, as a general anæsthetic, Dr. Richardson on 233
" " as an anæsthetic, Mr. Lawson Tait on . 234
Midwifery forceps, Dr. Vacher's new 135
Migraine, Dr. Anstie on the principles of treatment of . . . 37
Milk, Dr. Hodder on transfusion of, in cholera 25
" treatment of diabetes, Dr. Donkin on 72
Malony, Dr. P. J., on the treatment of stricture of the urethra . 146
Morbid growths in the larynx, Mr. Durham on section of the cartilages for removing 100
Morgan, Dr. J., on the danger of chloroform and the safety of ether as anæsthetics 236
Muscular asthenopia from over-work, hypodermic use of strychnia in . 52

Narceine as a narcotic, Eulenburg on 257
Nelaton, M., his treatment of boils by alcohol 168
Nervous break-down from over-work, &c., Dr. Broadbent on use of phosphorus in 49
Neuralgia and localized pains, Dr. Lackerstein's anodyne colloid for . 262
" with peculiar complication, Dr. Broadbent on use of phosphorus in. 48
" visceral, Dr. Allbutt on certain forms of 39
Nicotine, Dr. Drysdale on its absorption in tobacco smoking . . 264
Nitric acid, Dr. Atthill on its application to the interior of the uterus . 177
" Dr. Byrne on its use in uterine diseases . . . 182
" Dr. Churchill on its use in uterine diseases . . 181
" Dr. Kennedy on its use in uterine diseases . . . 182
" Dr. England on its use in uterine diseases . . . 181
Nitrous oxide gas, Editor of Lancet on a case of death from . . 250

Opium poisoning, Dr. Johnson on atropine as an antidote in . . 255
Ord, Dr. W. M., on the relation of gout to uric acid . . . 26
Os and cervix uteri, Dr. Bennet on the practice of dividing the . 206
Ovaralgia, Dr. Allbutt on the treatment of 227
Ovarian affections, Prof. Cleland on the use of guaiacum in . . 231

Paralysis, Dr. Carter on hypodermic injection of strychnia in . . 50
" Dr. Wilks on the use of galvanism in 53
tterson, Dr. A., his new hernia knife 120
hloride of iron, Dr. Barnes on its injection into the uterus . 224

PAGE
Phosphorus in certain forms of nervous disease, Dr. Broadbent on . 48
Phthisis, Dr. Anstie on the use of ergot in the hemoptysis of . . 63
" pseudo, Dr. Sansom on 68
Plaster for skin-grafting, Dr. Bligh's fenestrated non-adhesive . . 167
Playfair, Dr., on the causes of dysmenorrhœa . . . 198
" on intra-uterine medication in the treatment of chronic uterine catarrh 217
Plugging the posterior nares for epistaxis, Dr. Taafe's mode of . 115
" the posterior nares for epistaxis, Mr. Godrich's mode of . 116
Pneumatic aspirator, Mr. Jessup on the surgical uses of the . . 90
Popliteal aneurism, Dr. MacCormac's case cured by digital compression 108
" " Dr. Thompson's mode of applying pressure in . 110
Polypus of the rectum, Mr. Heath on the treatment of . . 124
Poore, Dr. G. V., on the influence of the continuous current over voluntary muscular action 58
" " on the treatment of chloroform poisoning . . 248
Porter, Dr. G. H., on removal of foreign bodies from the male bladder 135
Premature labour, Mr. Whitehead's method of inducing . . 182
Prolapsus ani, Mr. Heath on the treatment of 125
" uteri, Dr. Andreef on its treatment without mechanical means 208
" uteri, Dr. Drysdale on the treatment of . . . 207
Pruritus ani, Dr. Thompson on the treatment of . . . 130
" Mr. Heath on the treatment of 129
" W. B. on the treatment of 129

Quinine as a remedy in gastralgia, and ovaralgia, Dr. Allbutt on . 228
" in cases of blood poisoning 32
Rectum, Mr. Heath on abscess of, and fistula-in-ano . . . 126
" " on fissure of the 125
" " on polypus of the 124
" " on prolapsus of the 125
Reid, Dr. W., on the new French method of dressing wounds . . 103
Relapsing fever, Local Government Board's directions respecting . 17
Renal calculus, Dr. Garrod on the use of lithium salts in . . 150
" disease, Dr Dickinson on alcohol as a cause of . . . 82
" disease, Sir H. Thompson on its influence in operations for stone 130
Resina copaibæ a s a diuretic, Dr. Wilks on 263
Retention of urine, Dr. Macleod on the treatment of . . . 147
" " Mr. F. Jordan's new treatment of . . . 144
Rheumatism, Dr. Bartlett on its treatment with actæa . . . 31
" acute, Dr. Carter on the use of veratrum viride in . 262
Richardson, Dr. B. W., on methylene ether or ethyl . . . 233
Richardson, Mr. B. W., his ether inhaler, and on a mixture of chloroform and spirits of wine as an anæsthetic . . . 241
Roberts, Dr. W., on exploring and tapping 96
Rodent cancer, Mr. Hulke on the treatment of 35
Rogers, Dr., on the causes of dysmenorrhœa 201

Sansom, Dr. A. E., on inflammation of the lung as a canse of consumption 68
Scarlatina, Mr. Camden on carbonate of ammonia in . . . 23
" and enteric fever, Dr. Harley on the connection between . 21
Secale cornutum, on subcutaneous injection of, in uterine fibro-myoma 195
Silver, Dr., on the use of ergot in headache 42
Skin-grafting, Dr. Bligh's fenestrated non-adhesive plaster for . 167
Smith, Dr. P., on uterine fibroid degeneration and its treatment . 214
Smith, Dr. W. G., on the use of the direct and induced currents of electricity 261
Spasmodic affections, Dr. Wilks on 42
Sponge-tent, Dr. Bantock on its use for the treatment of menorrhagia 191
Squarey, Dr., on the causation of acquired flexions of the uterus . 213

PAGE

Stone in the bladder, Sir H. Thompson on influence of renal disease on the operation for 139
Stricture of the urethra, Dr. Molony on Hutton's railway catheter for 146
" of the urethra, Mr. Jordan's new method of treating impassable 144
" of the urethra, Mr. Teevan's case of impassable . . 147
" of the urethra, Sir H. Thompson on the treatment of . 140
Strychnia, Dr. Chisolm on the hypodermic use of . . . 52
" Dr. Carter on hypodermic injection of, in paralysis . 50
Surgical treatment of aneurism, Mr. Holmes on the . . . 105
Symblepharon, Dr. Wolfe on the treatment of . . . 153
Syphilis, Mr. Hutchinson on its communication through vaccination . 168

Taafe, Dr. R. P. B., his method of plugging the posterior nares . 115
Tait, Mr. L., on methylene ether as an anæsthetic . . . 234
Talipes varus, Mr. Clowes on the treatment of . . . 99
Tapping and exploring, Dr. Roberts's aparatus for . . . 96
" and exploring, Mr. Jessop on the pneumatic aspirator for . 90
" by fine canula and syphon-arrangement, Dr. Roberts on . 98
" by tubular needle and syphon-arrangement . . 96
Taylor, Dr. C. B., on ether as an anæsthetic 235
Teevan, Mr. W. F., his case of impassable stricture . . . 147
" " on the selection of positions for catheterism . 149
Thompson, Dr. H., his mode of applying pressure in popliteal aneurism 110
" Sir H., on the influence of renal disease on the choice of operation for stone in the bladder 139
" Sir H., on the treatment of stricture of the urethra. . 140
Tilt, Dr., on the cause of dysmenorrhœa 201
Tobacco amaurosis, hypodermic use of strychnia in . . . 52
" smoke, Dr. Drysdale on the absorption of . . . 264
Tongue, Mr. Whitehead on removal of, by the galvanic ecraseur . 117
Typhoid fever, Dr. Kennedy on the etiology of . . . 19

Ulcers, Mr. Cowen on a new method of treating . . . 165
Uric acid and gout, Dr. Ord on the relation of . . . 26
Urinary gravel and calculus, Dr. Garrod on lithium salts in . . 150
Urine, retention of, Dr. Macleod on the treatment of . . . 147
" retention of, Mr. Jordan's operation for relief of . . 144
Uterine catarrh, chronic, Dr. Playfair's treatment of . . . 217
" diseases, Mr. Clay's new insufflator for treating . . 229
" fibroid degeneration, Dr. Smith on its treatment . . 214
" " tumour, Mr. Jordan's cases treated by enucleation . 211
" fibro-myoma, subcutaneous injection of secale cornutum in . 195
" flexions, Dr. Squarey on their causation and pathology . 213
" hemorrhage, Dr. Bantock on the treatment of . . 191
" neuralgia, Dr. Allbutt on 227
" prolapse, Dr. Andreef on its treatment without mechanical means 208
" prolapse, Dr. Drysdale on the treatment of . . . 207
Uterus, Dr. Atthill on the application of fuming nitric acid to the . 175
" Dr. Barnes on reduction of chronic inversion of the . . 209
" Dr. Barnes on the modes of applying remedies to the interior of the 224
" Dr. Duncan on the orifices of the unimpregnated uterus, and their surgical treatment 202
" Dr. Sims on the application of nitric acid to the . . 177

Vaccination-syphilis, Dr. Harley on 171
" Editor of Lancet on 173
" Mr. Cooper on 172
" Mr. De Meric on 172

PAGE
Vaccination-Syphilis, Mr. Gascoyen on 175
" Mr. Hutchinson on 168
" Mr. Lee on 172
Vacher, Dr. F., his new midwifery forceps 185
Veratrum viride, Dr. Carter on its use in acute rheumatism . . 262

Wade, Dr. W. F., on chorea and its treatment 46
Wallace, Dr. J., his cases of cephalotripsy 189
Wells, Mr. T. S., on the causes of dysmenorrhœa . . . 201
Whitehead, Dr. J., on intra-uterine injections in chronic endo-metritis. 230
Whitehead, Mr. W., his method of inducing premature labour . 182
" " his removal of the entire tongue for cancer by the galvanic ecraseur . . . - . 117
Wilks, Dr. S., on resina copaibæ as a diuretic 263
" " on spasmodic affections . . . - 42
" " on the therapeutical uses of electricity . . . 52
" " on the therapeutical uses of electricity . . . 258
Will, Dr. J. C. O., his modification of acupressure . . . 111
Wolfe, Dr. J. R., on conjunctival transplantation from the rabbit . 153
Wounds, Dr. Reid on the new French method of dressing . . 103
" Mr. Hamilton on the recent antiseptic treatment of . . 86
Writer's cramp, Dr. Poore on its treatment by the continuous galvanic current 58
Wryneck, Dr. Wilks on cases of 43

NEW BOOKS AND NEW EDITIONS,

ISSUED DURING THE PAST SIX MONTHS.

⁂ *The Publisher of "Braithwaite" will supply every work in this list on receipt of the price, post-paid. Full titles, with the Publisher's name, will be given of all publications received.*

◆

Adams (William). Club Foot: Its Causes, Pathology, and Treatment. Jacksonian Prize Essay. Second Edition, with numerous illustrations. 8vo, pp. 464. Cloth. $6.

Allingham (William). Fistula, Hemorrhoids, Painful Ulcer, Stricture, Prolapsus, and other Diseases. Second Edition, revised and enlarged. 8vo, pp. 250. Cloth. $2.

Bennett (John H.) Text-Book of Physiology, General, Special, and Practical. With illustrations. 8vo, pp. . Cloth. $3.50.

Biddle (John B.) Materia Medica for the Use of Students. With illustrations. Fifth Edition, revised. 8vo. Cloth. $4.

Both (Carl). Consumption and its Treatment in all its Forms. The Practical Application of the Cellular Principle, etc. 8vo, pp. 160. Cloth. $2.

Bourgeois (H.) and **Damon** (H. F.) The Passions in their Relations to Health and Diseases. Translated from the French, by Dr. Damon. Boston: James Campbell, Publisher. 12mo, pp. 201. Cloth. $1.25.

Bryant (Thomas). The Practice of Surgery. With over Five Hundred Engravings on Wood. 8vo, pp. 984. Cloth. $6.25.

Brown (H. E.) Report on Quarantine on the Southern and Gulf Coasts of the United States. 8vo. Cloth. $1.25.

Byford (William H.) A Treatise on the Theory and Practice of Obstetrics. Second Edition, with illustrations on wood. 8vo, pp. . Cloth. $4.50.

Coles (Oakley). A Manual of Dental Mechanics. With 140 illustrations. 8vo, pp. 284. Cloth. $2.50.

Davis (Nathan S.) and (Frank H.) Clinical Lectures on various important Diseases, delivered in the Medical Wards of Mercy Hospital, Chicago. 12mo, pp. 250. Cloth. $3.

Erichsen (John E.) The Science and Art of Surgery: Being a Treatise on Surgical Injuries, Diseases, and Operations. Sixth Edition, enlarged. 8vo, pp. 1700. Cloth. $9.

Flint (Austin). A Treatise on the Principles and Practice of Medicine. For the Use of Practitioners and Students of Medicine. Fourth edition, revised. 8vo, pp. 1070. Cloth. $6.

Ford (C. L.) Questions on Anatomy. For the Use of Students. 8vo, pp. 136. Paper. $1.

Fox (Wilson). The Diseases of the Stomach: Being the Third Edition of the Diagnosis and Treatment of the Varieties of Dyspepsia. Revised and enlarged. 8vo, pp. . Cloth. $3.

Gouley (John W. S.) Diseases of the Urinary Organs: Including Stricture of the Urethra, Affections of the Prostate, and Stone in the Bladder. With illustrations on wood. 8vo, pp. 368. Cloth. $3.75.

Hammond (William A.) Insanity in its Relations to Crime. A Text and a Commentary. 8vo, pp. . $1.

Hoffman (Frederick). Manual of Chemical Analysis as applied to the Examination of Medicinal Chemicals. For the Use of Pharmaceutists, Physicians, etc. 8vo, pp. 391. Cloth. $3.50.

Leber and **Rottenstein.** Dental Caries and its Causes. Translated by Thomas H. Chandler, M.D. 8vo, pp. 104. Cloth. $1.50.

Lidell (John A.) A Treatise on Apoplexy, Cerebral Hemorrhage, Cerebral Embolism, Cerebral Gout, Cerebro-Spinal Meningitis. 8vo, pp. 395. Cloth. $4.

Ludlam (R.) Lectures, Clinical and Didactic, on the Diseases of Women. 8vo, pp. 662. Cloth. $7.

Maunder (C. F.) Operative Surgery adapted to Living and Dead Subjects. Second Edition, revised and enlarged. 12mo, pp. 376. Cloth. $2.50.

McClelland (M. A.) Civil Malpractice. A Report presented to the Military Tract Medical Society at its Fifteenth Semi-Annual Meeting, January 14th, 1873. Chicago: W. B. Keen, Cooke & Co., Publishers. 8vo, pp. 74. Cloth. $2.

Moorman (J. J.) The Mineral Springs of North-America. How to Reach and how to Use Them. With illustrations. 12mo, pp. 295. Cloth. $2.

Piffard (H. G.) A Guide to Urinary Analysis. For the Use of Physicians and Students. 8vo, pp. . Cloth. $1.25.

Purdy (A. E. M.) The Medical Register of New-York and Vicinity; for the Year commencing June 1st, 1873. Vol. XI. 12mo, pp. . Cloth. $2.50.

Ray (Isaac). Contributions to Mental Pathology. 8vo, pp. 338. Cloth. $3.

Ringer (Sidney). A Hand-Book of Therapeutics. Third Edition, revised and enlarged. 8vo, pp. 576. Cloth. $4.25.

Sanderson (J. Burdon). Hand-Book of the Physiological Laboratory: Being Practical Exercises for Students in Physiology and Histology. 2 vols. 8vo $8.

Seguin (Edward). A Manual of Thermometry. For Mothers, Nurses, and all who have Charge of the Sick and the Young. 12mo, pp. 72. Cloth. 75 cents.

Storer (Frank H.) A Cyclopædia of Quantitative Chemical Analysis. Part II. 8vo, pp. 120. Paper. $1.65.

Sturges (Octavius). An Introduction to the Study of Clinical Medicine: Being a Guide to the Investigation of Diseases. For the Use of Students. 12mo. Cloth. $1.25.

Thomas (A. R.) A Practical Guide for Making Post-Mortem Examinations and for Embalming the Dead, etc. 8vo, pp. 337. Cloth. $3.

Thorowgood (John C.) Notes on Asthma: Its Nature, Forms, and Treatment. Second Edition. 12mo, pp. 166. Cloth. $1.75.

Tibbitts (H.) A Hand-Book of Medical Electricity. With sixty-four illustrations. 8vo, pp. 150. Cloth. $2.25.

Unit d States. The Pharmacopœia of the United States of America. Fifth Decennial Revision. 12mo, pp. Cloth. $1.75.

Warren (J. Collins.) The Anatomy and Development of Rodent Ulcer. Boylston Prize Essay for 1872. 8vo, pp. 67. Cloth. 75 cents.

Walton (George E.) The Mineral Springs of the United States and Canada. With Analyses and Notes of the Prominent Spas of Europe. 8vo, pp. 390. Cloth. $2.

NEW BOOKS AND NEW EDITIONS ISSUED SINCE MAY, 1872.

⁂ *Supplied by the Publisher of* BRAITHWAITE'S RETROSPECT *free of postage.*

Allen (Peter). Lectures on Aural Catarrh and common Forms of Deafness. 12mo, pp. 277. $2 00

Allingham (William). On Fistula, Hæmorrhoids, and other Diseases of the Rectum. 8vo, cloth. $2 50

Aitken (William). Science and Practice of Medicine. Additions by M. Clymer, M.D. 2 vols. $12 00

Anderson (W McCall). On the Treatment of the Diseases of the Skin. 8vo, cloth. $1 75

Ashurst (John, Jr.) Principles and Practice of Surgery. Illustrated, 8vo, cloth. $6 50

Atthill (Lombe). Clinical Lectures on Diseases peculiar to Women. Second edition, 12mo. $2 25

Atlee (W. L.) General and Differential Diagnosis of Ovarian Tumors. Illustrated, 8vo, pp. 482. $5 00

Buck (Gurdon). Lithotomy and Lithotrity, illustrated by Cases in Practice. 8vo, cloth. $1 00

Beasley (H.) Pocket Formulary, and Synopsis of the Br. and For. Pharmacopœias. Ninth edition. $2 50

Bigelow (H. G.) Medical Education in America. 8vo, pp. 88, paper, 75 cents; cloth, $1 25

Bartholow (R.) Manual of Hypodermic Medication. Second edition. 12mo. $1 50

Bastian (H. C.) The Beginnings of Life, Illustrated. 2 vols. 12mo, cloth. $5 00

Beale (L. S.) Bioplasm: Introduction to the Study of Physiology. Illustrated. 12mo, pp. 346. $3 00

Beasley (H.) The Book of 3000 Prescriptions. Fourth edition. 16mo, pp. 500, cloth. $2 50

Black (D. C.) Functional Diseases of the Renal and Reproductive Organs. 8vo, pp. 300, cloth. $2 50

Bloxam (C. L.) Chemistry, Inorganic and Organic. Second edition. 8vo, pp. 666, cloth. $6 50

Both (C.) Small Pox. Predisposing Conditions and Prevention. Second edition. 12mo, pp 82. 50

Clarke (E. H.) and ***Amory*** (R.) Physiological and

Cobbold (S. S.) Worms; and Practical Helminthology. 12mo, pp. 178, cloth. $1 00

Carter (C. L.) Treatise on General Pathology 8vo, pp. 150. $1 50

Clymer (M.) Epidemic Cerebro-Spinal Meningitis. 16mo, pp. 59, cloth. $1 00

Chapman (E. N.) Hysteriology. Treatise on Diseases and Displacements of the Uterus. $4 50

Clark (F. Le Gros). Outlines of Surgery and Surgical Pathology. Second edition. 8vo, cloth. $4 25

Cohen (J. Solis). Diseases of the Throat and Nasal Passages. 8vo, pp. 582. $5 00

Dunglison (R. and J.) History of Medicine from the Earliest Ages. 12mo, pp. 287, cloth. $2 50

Dalton (J. C) Human Physiology. Fifth edition. 8vo, pp. 728, cloth. $5 25

Damon (H. F.) New Treatment of Venereal Diseases. From the French. 12mo, pp. 73. 50

Delafield (F.) Hand-Book of Post-Mortem Examinations. 8vo, pp. 376. cloth. $3 50

Eassie (W.) Hand-Book to History, Defects, etc., of Drainage, Ventilation, etc. 12mo, cloth. $1 00

Eliot (C. W. and F. H. ***Storer***). Comprehensive Manual of Qualitative Chemical Analysis. 12mo. $1 50

Elmer (W.) The Physician's Hand-Book for 1873. Revised. $1 50 to $1 75

Flower (W. H.) and ***Keen*** (W. W.) Diagrams of the Nerves of the Human Body. 4to, pp. 12. $1 50

Fisher (T. W.) Plain Talk about Insanity; its Causes and Treatment 8vo, pp. 97, cloth. $1 50

Fothergill (J M.) The Heart and its Diseases. 8vo, cloth. $5 50

Flint (A., Jr.) and ***Hammond*** (W. A.) Physiology and Diseases of the Nervous System. $9 50

Flint (A., Jr.) The Physiology of Man. Vol 4. The Nervous System. 8vo, pp. 470. $4 50

Frey (Dr. H.) The Microscope and Microscopic Technology. Illustrated. 8vo. $6 00

Gant (F. J.) The Irritable Bladder; Causes and Treatment. Illustrated. Third edition. 12mo. $2 50

Gross (S. D.) A System of Surgery. Fifth edition. Illustrated. 2 vols. imperial 8vo, sheep. $15 00

Galloway (R.) Manual of Qualitative Analysis. From fifth London edition. 12mo, cloth. $2 [illegible]0

Garretson (J. E.) A System of Oral Surgery. 8vo, pp. 1091, cloth. $10 00

Guersant (M. P.) Surgical Diseases of Infants and Children. 8vo, pp. 350, cloth. $2 50

Harley (G.) The Urine and its Derangements. 8vo, pp. 334, cloth. $2 75

Hewson (A.) Earth as a Topical Application in Surgery. 8vo, pp. 309, cloth. $2 50

Henry (M. H.) On the Treatment of Venereal Diseases in Vienna Hospitals. 8vo, pp. 49, cloth. $1 00

Hamilton (F. H.) Practical Treatise on Fractures and Dislocations. Fourth edition. Illustrated. $7 00

——— Principles and Practice of Surgery. Illustrated. 8vo, pp. 943, cloth. $7 00

Hartshorne (H.) Essentials of the Principles and Practice of Medicine. Third edition. 12mo. $2 [illegible]

Henderson. Life of James Henderson, M.D. Medical Missionary to China. 12mo, pp. 196. 75

Hewett (G.) Pathology, Diagnosis, and Treatment of Diseases of Women. Second edition. $5 00

Hodge (H. L.) Fœticide; or, Criminal Abortion. Fourth edition. 16mo, pp. 55, cloth. 50

Kirke's (W. S.) Hand-Book of Physiology. Illustrated. Demy 8vo, pp. 836, cloth. $5 00

Legg (J. W.) Guide to the Examination of the Urine. Third edition. 16mo, pp. 96, cloth. 75

Lee (B.) Correct Principles of Treatment of Angular Curvature of the Spine. Illustrated. $1 00

Lewin (G.) Treatment of Syphilis with Subcutaneous Sublimate Injections; with lithograph. $2 25

Loomis (A. L.) Lessons in Physical Diagnosis. Third edition. 8vo, pp. 237, cloth. $3 00

Markoe (T. M.) Treatise on Diseases of the Bones. Illustrated. 8vo, pp. 416, cloth. $4 50

Mitchell (S. W.) Injuries of Nerves and their Consequences. 8vo, pp. 377, cloth. $3 00

Meyer (M.) and ***Hammond*** (W. A.) Electricity in its Relations to Practical Medicine. 2d. Ed. $4 50

Macnamara (C.) Manual of the Diseases of the Eye. Second edition. 12mo, pp. 620. $5 00

Morgan (J.) Lessons in Nature and Treatment of Affections produced by Contagious Diseases. $[illegible] 75

Pereira (J.) Elements of Materia Medica and Therapeutics. 8vo, pp. —, cloth. $7 00

Paine (M.) The Institutes of Medicine. Tenth edition. 8vo, pp. —, sheep. $5 00

——— Philosophy of the Soul and Instinct as Distinguished from Materialism. 8vo, pp. —, sheep. $5 00

Peaslee (E. R.) Ovarian Tumors; their Pathology, Diagnosis, and Treatment. 8vo, pp. 551. $5 00

Reynolds (J. R.) A System of Medicine. Vol. II. Local Diseases. 8vo, cloth. $6 00

Roberts (W.) Practical Treatise on Renal and Urinary Diseases. Illustrated. Second edition. $4 50

Ross (J.) The Graft Theory of Disease. 8vo. cloth. $4 00

Rushum (W. B.) Aids to the Diagnosis of Diseases of the Kidneys. Illustrated. 8vo. cloth. $2 00

Simpson (Sir J. Y.) and (A. R.) Clinical Lectures on Diseases of Women. 8vo, pp. 789. $3 00

Smith (J. L.) Treatise on Diseases of Infancy and Childhood. Second edition. 8vo, pp. 750. $5 00

——— (S.) Doctor in Medicine and other Papers on Professional Subjects. 12mo, pp. 308, cloth. $2 00

Stricker (Prof. S.) A Manual of Histology. 8vo. pp. 1094, cloth. $10 00

Swayne (J. G.) Obstetric Aphorisms, for Use of Students. Second edition. 12mo, cloth. $1 25

Turnbull (L) Clinical Manual of Diseases of the Ear. Illustrated. 8vo, pp. 486. $5 00

Thomas (T. G.) Practical Treatise on Diseases of Women. Illustrated. 8vo, pp. 784, cloth. $5 00

Tanner (T. H.) Memoranda on Poisons. Third edition. 18mo, pp. 155, cloth. 75

Thudicum (J. L. W.) A Manual of Chemical Physiology. Illustrated. 8vo, pp. 195, cloth. $2 25

Tuke (D. S.) Illustrations of Influence of Mind on the Body. 8vo, pp. 444, cloth. $5 50

Wunderlich (C. A.) and ***Sequin*** (E.) Medical Thermometry and Human Temperature. 12mo. $2 00

Wood (G. B.) Historical and Biographical Memoirs. Essays, and Addresses. 8vo, cloth. $5 00

Watson (Sir T.) Principles and Practice of Physic. 2 vols. 8vo, about 900 pp. each, cloth. $9 00

Wagner (R.) A Hand-Book of Chemical Technology. Illustrated. 8vo, pp. 761, cloth. $5 00

Ward (S.) On Some Affections of the Liver and Intestinal Canal. 8vo, pp. —, cloth. $3 00

Wells (T. S.) Diseases of the Ovaries. Illustrated. 8vo, cloth. $4 50

Wharton and ***Stille***. Medical Jurisprudence Third edition. 8vo, pp. 873. $7 00

Williams (C. J.) Pulmonary Consumption; Nature, Varieties, and Treatment. 8vo. $2 50

Woehler and ***Fittig***. Outlines of Organic Chemistry. 12mo, pp. 530, cloth. $3 00